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William Wheatley: A Retrospective

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Certificate of Approval

Master's Thesis

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Melissa K. Kaup

With a Major in Graphic Arts Publishing
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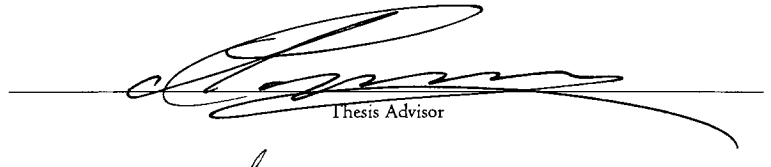

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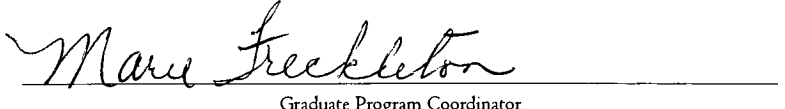

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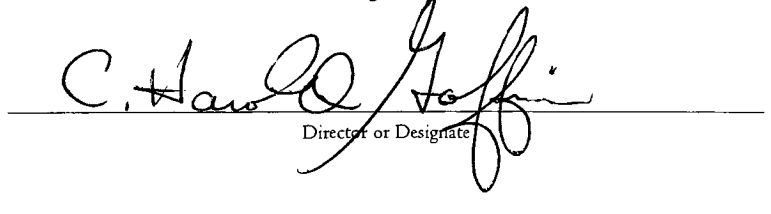

Director or Designate

William Wheatley: A *Retrospective*

by Melissa K. Kaup

A thesis project submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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May, 1999

Acknowledgments

I have many individuals who I wish to acknowledge and thank for their unselfish participation in the process of this thesis project. First, I would like to thank Mr. William Wheatley for dedicating his time and effort in recollecting his memoirs from such a tumultuous time. Second, to my thesis advisor Professor Archie Provan, for his constant guidance and direction. Thirdly, to those who offered their first-hand knowledge and advice on an era that has not been well recorded, specifically Professor Frank Romano and Professor Alexander Lawson.

Finally, I would also like to mention the generous support of Monotype Corporation for funding my travel expenses to Charlotte, North Carolina to obtain Mr. Wheatley's recollections of mechanical typesetting.

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Abstract

William F. Wheatley was an active participant during the "turbulent" typesetting years. His first years in the typographic field were spent working beside Bently Raak at Varityper Corporation. They worked with character designs for the Varityper and the Headliner "cold-type" line of machines and moved into collaborating with Photon, Inc. for photo-typesetting machines.

As the necessity for typographic experience increased for foreign languages, Mr. Wheatley was transferred to Varityper's European division. In the daily effort of obtaining typefaces and designing proper character sets, he became associated with many of the European type foundries and companies.

Mr. Wheatley's experience in the field also includes the Compugraphic Corporation in Europe and the Itek Corporation in the U.S., which has led to multiple typographic consulting assignments.

Chapter 1: Introduction

The history of the printed word has taken many turns throughout the past 500 years. Unfortunately many important pieces of this puzzle have been lost or loosely recorded. It is rare that we have the opportunity to interview a person who was actively involved in the later stages of the typesetting industry. For over 35 years, William F. Wheatley had been one such active participant in the typographic field. He was an employee for three corporations that engaged in the technological growth of printing in the mid-twentieth century: Addressograph-Multigraph Corporation, Compugraphic Corporation, and Itek Corporation. An interview with Mr. Wheatley is the capture of a moment in history that will benefit the future generations in the printing field.

Having an interest in typographical design, an opportunity to interview a participant in the area of mechanical typesetting and thus explore a portion of the history of type design was appealing. What was found, was a world of complexities in a "simple" creation of an alphabet.

Today it is a relatively simple task to select a typeface from the software font menu. It is as simple as pushing a button—and it is as easily overlooked.

When a process appears easy to the user, it tends to overshadow the technological complexities. The calculations and attention to detail needed in the formation of a group of characters is astounding, as this interview will begin to unveil.

Chapter 2: Background Significance

The printing industry developed very slowly in the four centuries following Johann Gutenburg's discovery of moveable metal type. With the introduction of the Mergenthaler Linotype machine in 1886, [See figure 2.1, PAGE A.2] the scene changed. The long-established procedure of handsetting metal type from a type case was transformed into a mechanical process.

This new method of mechanical typesetting was known as "hot-metal" composition. In addition to the Linotype, which cast a molten lead alloy into matrices, producing solid lines of type, there was the Monotype, which cast one character at a time, and the Ludlow, which was used to set display type for headlines. The technological achievements of these outstretched the experience and capabilities of the press room and it became difficult for them to keep up with the rapid changes that were developing in the industry.

The next development in the industry was referred to as "cold type," or "strike-on composition," or also as "direct impression." It was the use of typewriter-like machines, which could set lines of text using a keyboard. The Varityper, developed from the Hammond typewriter in 1933, was one of the first of these machines. Once the text was typed up, it would be photographed, and then it would be prepared on a printing plate for offset printing.

The use of photographic projection for producing type spurred development into "phototypesetting." A typographic image was exposed through a lens from a spinning disc and onto a special photo-sensitive paper.

The years 1950 to 1985, in which these developments took place, was the most turbulent period in the 500 year history of typesetting. At the fast rate of developing technologies, the industry not only had to worry

about the current mode of setting type, but the constant introduction of new methods. This problem was compounded with the dependence on peripheral products, such as the glass discs used in phototypesetting machines, that added their own limitations to the mix.

In addition to the technological problems, the mental change-over that was needed to embrace the technology was slow and difficult. The misunderstandings between the designers and the engineers resulted in difficult and expensive machine design changes, as well as a high-level of frustration in the attempt to meet the demands of the client faster than the competition.

During this "turmoil" period, the subject of this interview thesis, Mr. William F. Wheatley, held a front-row seat in the typographic community. Through working directly for three companies: the Varityper division of Addressograph-Multigraph, Compugraphic, and Itek, his memories give a bird's eye view into these times of radical change and varying opinions in the typographic industry.

Chapter 3: Literature Review

Being the nature of an interview, most of the information was obtained directly from Mr. Wheatley. For clarity, the following literature was initially referred to:

Varityper Typefaces: A Guide to Better Typography by Varityper
An introduction to the Varityper product line capabilities and the typefaces that were available for the Varityper models. This reference produced by Varityper was used to become more familiar with the company and the products that gave Mr. Wheatley his introduction into the typesetting arena.

A Concise Chronology of Typesetting Developments 1886–1986 by L. W. Wallis
An invaluable guide to the history and developments pertaining to the many people, corporations, and equipment that shaped the past century in typesetting. In order to fully understand the trials and trends of the era which Mr. Wheatley was a participant, an overall look at the time in question was required and was found in *A Concise Chronology of Typesetting Developments 1886–1986.*

Type Design Developments 1970 to 1985 by L. W. Wallis
A guide to the major companies and the designers involved in typeface developments during the phototypesetting and digital type era. *Type Design Developments* was used as look at the instrumental participants in the final years of Mr. Wheatley's career in the typesetting industry.

Chapter 4: Statement of the Problem and Goals of the Project

The years between 1950 to 1990 were the most turbulent period in the 500 year history of typesetting. At the fast rate of developing technologies, the industry not only had to worry about the current mode of setting type, but the constant introduction of new methods. This problem was compounded with the dependence on peripheral products, such as the glass discs used in phototypesetting machines, that added their own limitations to the mix.

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Chapter 5: Methodology

Initial research on the period 1960–1985:

- Mr. Wheatley's background and experience
- The Varityper and the Coxhead Company
- Typographic movements in the time period

Questions for Mr. Wheatley were generated with the advice of Archie Provan, Alexander Lawson, and Frank Romano. They were divided into chapter sections by the corporations which Mr. Wheatley worked with.

- Varityper Corporation, US
- Varityper Corporation, Europe
- Compugraphic Corporation
- Itek Corporation
- Consulting
- Summary and Conclusions

A three day interview with Mr. Wheatley at his home in Asheville, NC was accomplished in June 1998 and the interview format as follows:

- *Italic Text—Questions asked to Mr. Wheatley by Melissa Kaup.*
- Normal Text—Answers by Mr. Wheatley.

Transcription of the interview.

Continual access to Mr. Wheatley via e-mail to clarify points.

Editing and verifyication of the interview information was accomplished by access to Mr. Wheatley's files, the Cary Library, and professors Archie Provan, Alexander Lawson, and Frank Romano.

Final proposal presentation.

Equipment

A tape recorder for the interview with Mr. Wheatley.

Facilities

None necessary.

Anticipated Costs

Estimated $500 in travel expenses to visit Mr. Wheatley at his home in Charlotte, NC. This stipend was graciously donated by Monotype Corporation.

Timetable

Interview with Mr. Wheatley was accomplished in June 1998. The transcription of the interview was completed by the Winter quarter 1998. The research and correspondence with Mr. Wheatley to clarify points will take place during the spring quarter. The final thesis presentation by the end of the spring quarter.

Chapter 6: Varityper Corporation, US

What did your business career comprise of?

The major part of my business career was involved in the typographic development field during the largest transition of technologies. This period from 1964 through 1985, saw the most developments to date in how type was set and how technology changed. I worked for three companies during that period: Varityper Corporation, a division of Addressograph-Multigraph; Compugraphic Corporation; and Itek Corporation. [See figure 6.1, page A.4]

All three of these companies were created to develop equipment for typesetting, although Compugraphic had just been founded in 1960 and Itek did not exist when I started in 1964.

I called all of the companies I worked for the "have-nots" since we did not own any typefaces, and did not have a tradition as a typesetting company. In these days typefaces were owned by the traditional typesetting machine manufacturers, and we were forced to copy that which already existed, or license it, which was in its infancy. Thus a "have-not" when it came to having the typefaces needed to compete in the marketplace.

When I started with Varityper Corporation in 1964, it had a product line which consisted of the Varityper composing machines [See figure 6.2, page A.6] in different iterations and the Fotolist camera, both using "strike-on" technologies, and a Headliner [See figure 6.3, page A.6] using a photographic paper.

Compugraphic was founded by Bill Garth (a former president of Photon, Inc.) and Ellis Hanson. The company's first machines were hardwired computers for typesetting control.

Itek Corporation was established in 1976 with one phototypesetting machine called the Quadritek.

What memories do you have of working with Varityper's typographic designer Bently Raak,?

In 1940, Bently Raak joined Varityper, then known as the Coxhead Corporation as the Director of Typography. Bently was a native of Iowa and he gained his degree in Printing and Journalism at South Dakota State University. He spent a short while at Syracuse University before coming to the Coxhead Corporation.

During his time at Syracuse University, he came in contact with Frederic W. Goudy, America's most well known type designer. After the disastrous fire which destroyed Goudy's historic Village Press, Dean Spencer of the School of Journalism offered Goudy the engraving machines that the school had just acquired for cutting matrices under Goudy's supervision. I believe the instructor of this course was Bently who had just resigned to take a position in New York with the Coxhead Corporation.

It is my belief that when Bently Raak came on board in 1940, the Coxhead Corporation gained one of their greatest assets, and one that would be the guiding light for Varityper and other typesetting machines that would evolve throughout the next 35 years. Since all of the company products involved type and typesetting, Bently, with his meticulous eye for detail and his excellent understanding of type and typography would assist in the development of all the products. Bently Raak was my mentor, and through him, I learned so much about the industry.

One of Bently's letterpress books, *As the Spirit Moves*, was printed in Manhasset, New York in 1941. He and his associate C. Douglas Barnes tipped in a three-cent stamp issued in September 1939, which was a commemorative of the Stephen Daye Press, the first English press used in the Colonies. The book was set in Goudy's Truesdell, which was one of Goudy's "lost" typefaces cast in 1931. I gave four cases of Truesdell foundry type to Rochester Institute of Technology [RIT] in 1971 or 72.

This book was one of the two books Bently directly gave to me, so I know that he was using the Goudy types.

Beyond his everyday work, he also spent his free hours in designing a ring in Aramic (ancient Semitic language) and weaving a rug using all the early printing marks of famous printers like Fust & Schöffer.

The early days of the typographic department were spent in developing for the Varityper and Headliner machines. It was not until IBM came out with the Magnetic Tape Selectric Composer [MTSC] in 1966 that serious work began in developing typefaces for the new photographic technology, i.e. second-generation typesetters.

This was divided into two diverse categories:

The first was Headliner typefaces, which were display typefaces for use on our series of Headliners. These were the faces of the day used for advertising, newspapers, bulletins, etc., and all were mainstream typefaces available from other typesetting machine vendors, such as Ludlow Typograph Co. We did create some special application fonts such as E-13B font both for offset and letterpress printing applications. This was "window font" which allowed you to put a negative on the type master and actually produce duplicates of artwork, logos or whatever.

The second was typefaces for the Varityper machines themselves. We had many different models, so we tried to keep a design schedule to satisfy them all. For instance, engineering machines used unit spacing fonts, and we created various styles for different applications. such as bills of material, spec sheets, and drawing dimensions.

The largest schedule was on the type styles for the various typesetting Varityper machines. This evolved through the different models, but basically we were trying to create type designs that would help sell these machines.

We developed a series of News Gothic faces, did a Clarendon, and also a Helvetica series, which we called Megaron. This was a great breakthrough, and I think a great result based on the fact that we were designing with only three increments [set widths]. [See figure 6.4, PAGE A.7]

This face is a great example of Bently's inguenity in developing a typeface. [See figure 6.5, PAGE A.7]

Bently did everything. He created a marketing promotion at one time for a series of Headliner machines. He copied an early Roman indulgence. If we published it, the promotion would have stated that the first Headline was done in Roman times. Not only did he letter the promotion, he colored it, and he made it look like a scroll. He must have spent a week on it, just making "This is the first Headline." We never did anything with it.

I ended up writing all of Bently speeches for him and also handled all his correspondence to management, as well as inquiries from the field, consisting of applications, special type characters, and future developments. He was really patient and would never cross anybody.

We had a marketing person who would call at nine o'clock, "Bently, come up here." Bently would go up to the executive offices and he would be gone for hours. I would wander into those offices and he would be sitting there. I said, "Why are you waiting?" "Well, he hasn't had time to see me yet." I said, "Bently, get out of here. Get back to work."

Arguing with engineering was Bently's one vice, because he always felt that engineers didn't know anything and they demanded him to prove his point. And he always did.

With machines like the Fotolist camera, he would spend a week figuring out the focal length of a lens. When they came out with the typesetting machines, he sat down and told them what kind of lens they needed to

result in what kind of magnification, so we would get a good scaling of fonts. But obviously in a typesetting machine, it is not like foundry type —8-point and 10-point designs are not in proportion to each other. In a typesetting machine they have to be.

Do you have any inside information on Varityper, how it started, interactions between people?

I don't know much about the company before Addressograph-Multigraph [AM] bought it, except Stuart Coxhead, General Manager for the International Division, who was the brother of Ralph, was still active in the business. Ralph Coxhead developed the original Varityper from the Hammond typewriter. [See figure 6.6, PAGE A.8]

Becoming a part of Addressograph-Multigraph did not benefit Varityper. I don't know how AM decided to buy it, but I remember Varityper went through all kinds of difficulties. AM was constantly bought and sold. One time they were owned by Roy Ashe who would acquire companies to just sell them off.

The headquarters for Addressograph-Multigraph were in Cleveland, but we were in New Jersey at the Varityper type department. During one period we were considered the "typing pool." Management from Cleveland would call every month to ask how many employees we had and how much we typed. It was because we just didn't fit. We were designing typefaces, but they had nothing like that in any other of their divisions.

The whole thing was ridiculous. They wouldn't recognize Varityper as a specific division in New Jersey while the rest of the company was out in Cleveland and Chicago. It was a strange company.

When I first went to work, Varityper was on Frelinghuysen Avenue in the center of Newark, New Jersey. Beautiful place! Ha! When we first moved there, my wife came by with the car to pick me up. I was stand-

ing on the street corner and she drove right by. She finally turned around. I said, "Why didn't you stop?" She said, "I couldn't believe you worked in such a terrible place."

Another missing element in the history of the Varityper machine is the big Chicago strike in 1947, which actually was broken by the Varityper. The *Chicago Tribune* went on strike and Bently Raak apparently shipped about 50–60 Varityper machines to Chicago. The newspapers actually were published using Varitypers, which ended up breaking the strike in Chicago.

I called the *Chicago Tribune* to find out more about the event and they said they had no archives. [Labor correspondent of the *New York Times* wrote several articles on this strike.]

One time I prepared a talk about type at a show and it is a funny story. I was planning a talk about type and the transition of type. The first part of my talk was going to be the noise of a Linotype machine. Just the chh-chh-chh-chh-chh. I can remember years ago when I was walking down the street I could tell if I was by a newspaper, it was a very distinctive noise. I can't tell anymore because hardly anyone is running a Linotype machine.

I told Archie Provan at RIT, "I'm coming up and I want to record the sound of the Linotype machine, because I'm going to use it as background noise." I went up there and there was not a machine in operation. Nobody had probably used the Linotype machine in years. Finally, they were able to get one working and I got the noises of the Linotype. I still have the tape. It's now a piece of history.

The Monotype machine made noises as well. The keyboard makes different sounds than the caster. It's a different chug-chug-chug noise.

What did the name Varityper stand for?

The name Varityper stood for the fact that you could change typefaces, "variable types." In 1948 the Varityper being marketed by the Coxhead Corporation, was a unit spacing machine. Similar to typewriters of the day, each character took up the same amount of escapement, thus "unit spacing." During my career we did not design many new unit spacing types, except we actually made a 13-point cap face, which was the almost the limit allowed for engineering drawings.

What methods did you used to promote the Varityper?

The Varityper brochures were actually all done on the strike-on machines. We had an advertising department that did all the promotional pieces, and they usually conversed with us on type styles to be used depending upon the application.

In the typographic department we had a full-time person for a type specimen book. As I think about it now, years were spent just doing specimens for our sales force and for our customers. Everyone else was in the same boat, because at this time our competition was basically the Monotype, or the Linotype hot-metal machines, because no one had a phototypesetting machine.

What was the attitude of the typesetting market toward the Varityper?

Well, that was the problem. Looking back, Ralph Coxhead originally bought the rights to the machine in 1933. It was made as an office machine, but it was an office machine that could do so much more than just type. You could do typewriting, you could do office forms, and you could do everything on this one machine. Even the Linotype couldn't do that. Of course it was "cold type" and in the early days was only done with unit spacing type faces.

Mimeography [See figure 6.7, PAGE A.9] was big with secretaries doing stencils and the Varityper was a fantastic machine for cutting stencils. That is where they thought the machine was really going to go.

As the other machines were developed, and this was where the Varityper was hurt, the other companies had truer versions of typefaces. Their typefaces looked like foundry typefaces and we were struggling with only three increments for the character widths for all typefaces.

So we were going to go under because our machines had limited increments compared with their typesetting machines. Even as hot-metal machines improved, more typefaces began coming out, and more companies were making them. We really were stuck with the one machine and it's severe limitations.

So what market really accepted this product?

The Varityper machine was being sold into the office market. When we moved into the phototypesetting machines, it was a whole different market place, but we didn't have a sales force that was behind it.

At Varityper Corporation, every new salesperson was sent to the type department for training. This was part of a week long program covering all aspects of selling our equipment. The basis of the lectures we used to give to the sales force would include the classification of typefaces, what spacing material was, hot-metal type, the Varityper names of the typefaces, and so on.

This sales class was my first exposure when I came into the company and this was how I, as the lowly salesman, got my position in the type department. Eventually I was giving the sales class.

In retrospect, it is interesting now. Here was a company making strike-on machines, but yet we were teaching our salespeople about real type-

faces—concepts like what old style roman was, what a newspaper face was, and what a serif was. The machine probably couldn't do any of these things very well, but we still took the time.

In the type department, we were the only ones that did anything about type and typography for the typesetting machines. There were engineers and other people working with type, but we directly worked on the applications and brochures. We were talking to people about what type is and how you can get back into it. Actually, we were fairly successful in marketing machines to customers who were going to trade in their Varitypers for phototypesetting machines, which was quickly becoming the way of the world.

It was a major change over to phototypesetting. In the Varityper composing machine you are dealing with a piece of paper, you put it in the machine, you smash-on the type, you take the paper off the machine, and then you paste it up. Now in a phototypesetting machine you take the paper out, you put it in a canister, take it into your darkroom, develop it, and then you paste it up. You have all these other steps to do. A lot of the shops that had the phototypesetting machines really weren't experts and it was a very difficult transition.

Were the typeface designs an important part of the manufacturing of the Varityper?

In all my experiences, any new machine that we ever released, the typefaces were the last consideration. And in a lot of cases, it trapped us. This was not true of different models of machines, but only new machines.

Engineering would work on a project for nine months and come up with an engineering concept about how it was going to work. This was where the lens system was going to be, this was where the characters were going to move, and this was the escapement of the paper and film.

They would come over to the type department and say, "Well now, how about the type?" We would say, "We can't do that. I mean there is no way we can do what you say you want it to do." Either they accepted that or we would have to try to condition the typeface into what they had done.

It was terribly frustrating, because the only reason we made those machines was to set type. You think that somebody would say, "Well, let's go talk to the type people and see what they think or what they recommend."

We were always in trouble with type budgets. We could never know what we were going to get into. We did specials and charged a few character specials, but we could never make enough money designing. We always ended up throwing away what was wrong and starting over with a new machine.

I don't ever remember doing a projection, "Ok, I'm going to come out with a new machine, and how much do you project it is going to cost you in typefaces?" I don't remember any of these projects being money driven on the basis of, "Okay guys, you have $10,000, $50,000 or a million dollars to develop a type." We just did it.

What equipment were you making typefaces for?

We were making typefaces for the Varityper composing machine and also the Headliner. The Headliner really was a fascinating machine and I am trying to find out more about it. I was there when the Headliner came in, but I can't find anybody to tell me how it actually came into existence.

Dick Wurtz invented the Headliner and brought it to Varityper. At that time Varityper was its own corporation, before AM bought it. Wurtz brought in a box he had designed. His father was a funeral director, so the box was actually made out of old wooden casket pieces. It had about 50–60 springs. It was really a breadboard, not a machine.

What I can't find out is how Varityper ended up owning the machine. I know that they bought the rights to it, but I can't find any of the paperwork or patents.

The most unique thing about the Headliner was that we were taking foundry type and actually reproducing it on a plastic disc. As the light came on and exposed the character on the 35mm tractor feed paper, the actual set width of the character was translated into a slot depth cut in the plastic font master. When you located a letter "a," to print, you got the slot depth of its set. This would be offset by so many characters, so that people could not tell which slot went with which character.

It was supposed to be a secret, that the characters were offset. I don't remember the exact amount it was offset, but if you were printing a lower case "a," the slot for the "a" was in a different area.

The offset was applied so the disc couldn't be duplicated. It would be very difficult to measure the slots and figure which slot went with which character. You know that the deepest slot is giving you more paper and the narrower slots are giving you less paper, but would take a long time to figure it all out.

The Headliner was so easy to use that anybody could use it. The spacing couldn't be screwed up because it provided the accurate character/character spacing. When we photographed the letters to make the artwork, we would actually photograph a font of foundry type. We butted a piece of brass on each side of the character and photographed it.

This became the set width that was converted into a numerical decimal equivalent. There was some kind of weird formula that took the actual width of the character plus some magic number, which then interpreted to the slot depth.

Was there a chance to adjust the kerning and letterspacing on the Headliner?

On the later Headliner machines you could actually set the letterspacing or you could set to kern. Bently came out with one machine, which was called the AM 880. Since you could set text, we actually made text spaces for this machine. The problem with the AM 880 was that it was so complicated that nobody, except Bently, knew how to run it.

With the AM 880, you could now compose text and set very finite line spacing to have a line almost touching another line. You could adjust the leading. You could make a whole 8.5 x 11 page on photographic paper. It was a great machine, but it had many dials to be set. I know that people in the field didn't understand it, because it was very difficult.

Was there a cover on it because you were using photographic paper?

No, that is just the way they designed the first one. I don't quite know why. The last machines didn't have a cover. In fact they even took off the handle. They found that people were just putting their hands directly on the film disc. All it was, was a piece of plastic with the grooves cut in it and a piece of film that was adhered to the back of it. It was a special process.

When I was in Europe with AM, we wanted to set up the manufacturing of all the European Headliner discs in Europe. We were not able do it because of the European laws for acetone and the other chemicals used to affix the film to the plastic. They wouldn't allow us to put it in our building. We would have had to have a separate building for chemical processing because those chemicals are really volatile.

In the New Jersey plant, the manufacturing division was in the same building. Nobody cared. In Europe they required another building because it would kill everyone if it blew up. The difference in the cultures was very interesting.

Were the earlier Headliners difficult to use?

The really old Headliner machines look really complex, but they were so simple. There was really nothing to do with it. There was a place to put your copy, the copyholder. They had handles to move the font disc. The machines became easier over time. The last machine released in 1967, the AM 810, didn't even have the handles on it; you just moved the disc where you wanted it.

Another influence from Bently, was the three-line newspaper Headliner discs. These discs actually had three lines of type on the master, all the same size. They were used by setting the first line of type, reversing the paper, and setting the second line, and then reversing again, and setting the third line. Then you processed it, and had a three line headline ready to go. This was only made available in certain styles, such as Bodoni, and there was a sans serif style. They could be used on any of our available machines.

Was the Headliner machine available after the Varityper line of machines?

No, the Headliner was available about the same time. So, we had two machines: the text machine and the headline machine.

Another machine the company came out with was a Fotolist camera in 1957. I'm trying to find out, but I think Bently holds the patents on this machine. The Fotolist camera actually used IBM punch cards. We had a special model Varityper with a holder for an IBM punch card. It would print just the one line for directories. Because these were punch cards, you could actually do a sort.

In fact, this was how the Japanese telephone directory was done. We would use a special Japanese typewriter with a card adaptor on it, it was a sequential card machine. Then the decks could be sorted any way you wanted it to duplicate the directories. Since there was only one line on a card, the card was thrown out for updates and a new one put in.

The Air Force did all of their directories on the Fotolist machine. Also in 1960 it was used by the British to produce the *British National Bibliography.* When you get into anything like this, it is the kind of work that Bently Raak would do. He would spend hours on it.

In using the Fotolist camera you were required to have many special charts for sizing, leading, character counts, etc. Bently would never use the calculator and do everything with his pencil. He would just sit for hour after hour writing out formulas. It was amazing. It truly was amazing.

Varitypers were also used by the military?

The military did their own publications with the Varityper in WWII. In 1942–3 to save space, the Navy began to replace hot-metal printing shops on ships. The surrender document of WWII was done with a Varityper on General MacArther's *USS Missouri* with the victory in Japan. There used to be a copy of the document in the office of the vice president and general manager of Varityper Corporation. I called him and asked him whatever happened to it. He didn't have a clue. [See figure 6.8, PAGE A.10]

I wonder if a copy is still in Washington, D.C. I assume that the government must have a copy of one, because it was a contract.

In 1963, the Army collaborated with Varityper to develop a number coding system for some foreign languages. For a long time the Varityper had been used by the government in the field on Navy ships. Their purpose was psychological warfare. We used to work for the psychological war in Natick, Massachusetts.

We were being contracted to design the typefaces for the Varityper and the Headliner that were to be put to work as propaganda for the military field operations. I was involved a lot in these government contracts. I obviously didn't know any of the languages: Vietnamese, Cambodian, and Laotian. From these languages you can tell what period of time this was.

Professor Ray at Southern Illinois University would send us frequency studies of the language alphabets. That was all we had to work with. The first thing we would have to do is establish the most frequent use of a character based upon his calculations. Then the Army would send us the drawings.

Frequency studies of a character means?

Character usages. For example, how many times the lowercase "e" was used.

Of course we didn't know what the most frequent character in Cambodian was, but the studies showed it. Well, they thought they did.

We had a lot of correspondence with the military. It probably took us eighteen months to do one of these contracts. I spent a lot of time going back and forth with Ray. We would find that they would forget about the punctuation in their frequency studies.

There was one language, Gurmukhi, an Indian script, that used a straight bar for the period. Obviously every sentence would end in a straight bar, but they had neglected it. A period is a pretty frequent character and they had left it out.

This line would show up and I would say, "What is this? Is this a mistake?" or in the old days we would call it a "work-up." If you had a thin space that was not properly placed on a press it would start to print. You would call that a work-up.

I would have to call Ray and say, "Let's find out what that line is." He would say, "Oh, that's the period!" I said, "Well, maybe we need to move it up in the frequency."

It was interesting because you would end up learning so much about the language. Although I have never learned one word of Cambodian, after awhile I would look at a Cambodian book and recognize the shapes and how the word forms would reoccur. [See figure 6.9, PAGE A.11] It was all a study.

How many characters could the Varityper carry?

The Varityper carried two fonts with ninety characters per font. [See figure 6.10, PAGE A.12] The anvil moved up and you could twist it around. There was a font on the front side and one on the backside. The other thing, which it would also need, was a coder, especially for the languages. The coder was what set the increments for the set width of the typeface, whether it was two, three, or four.

The whole point of the character studies was to develop fonts using the highest frequency characters on the prime font. Since, as mentioned, the Varityper machine carried two fonts of ninety characters each, we wanted most of the keyboarding to be done from the prime font.

A Varityper had three shifts and you had to determine ninety characters. If you have only thirty keys on a typewriter and you have ninety characters, you need three shifts: a lowercase, uppercase, and then a figure shift. We would come up with the first ninety and then the secondary ninety. That's how we had to design the fonts.

The other problem with some of these languages, especially with the Arabic language, there would be extra characters that connected. The character had to be designed in such a way that if you hit one key, you always had to hit another specific key because of the connector.

Figuring out this keyboard was not something that was done in five minutes. We did not want to make these fonts with the characters out of position because we would have to go back in three months and redo all the characters.

We couldn't expect the G.I.'s to figure the language out either, so we had to come up with number codes. We numbered the keys from one to thirty, then a linguist would number code the copy. In other words, there

would be key one, key two, then a circle would mean caps, and a triangle would mean finger shift, etc. The linguist would write out the copy, then anyone could follow through and compose it. It was just following the numbers.

We did the same thing on the Headliner, although obviously it was more complex. You would have to follow the positions of the characters.

When was the Russian psychological warfare and what involvement did Varityper have in it?

It had to be when we were at the height of the Cold War. I went to Europe in the 70's, so it had to be somewhere between 1965 and 1970. There was always a lot going on in those years. Even the psychological war contracts were further involved. I think the only reason that we got involved with those jobs is because of the confidence they had in Bently.

Because of the psychological warfare, the CIA went into the print shops in Russia to photograph the Russian specimen books. They wanted Bently to design some typefaces from these books. He had all the drawings and prints for these typefaces in his office.

It never really came to anything, I don't know why. I don't know whether it was that they wanted to do a contractual agreement and nobody wanted to do it, or maybe the money wasn't right.

I thought it was interesting that Bently had those kind of connections. He visited East Germany with a number of the salesman who were attending a sales meeting, and the CIA knew he was there, and when he went in and came out of East Germany. It is pretty amazing even years after that it is still unclear. But you never really knew, because Bently would never talk about it.

These were United States government contracts?

They were all for the United States government's propaganda. Once we had the characters figured out, we determined what code [set width] category the character was going to be in. Is it coded a four or a three or a two? The designer would figure out how much width was to be allowed. Then we could actually start the design work.

Still, we had to determine what we were going to do with the characters. We had to design a coder, which then would match the increments. The "w" on an English keyboard with the coder would be replaced with a character. If we put a 3-unit character there instead of 4-unit character, we could change the escapement of that key from 4-units to 3-units just by changing the code.

What was the coder used for?

It was for escapement. When you press the key, it's advancing the paper, so you had to move it along the correct number of increments.

All of the Varityper strike-on machines were capable of justification, with two typings. First you typed the line you wanted, hit a tab key then re-typed the same line. The machine mechanism, which had stored the first typing, would ensure each line to be the same length. Obviously the extra space had to be placed between words.

With the development of a coder, we could now have variable spacing, as the coder would control the escapement of each character. It must be remembered that we only had three increments, so we had wide characters at four, normal at three, and the lowercase "i," "l," and punctuation at two.

What was the DSJ machine?

All Varityper composers were actually DSJ machines, which stood for Differential Spacing Justifier, which meant they used the three increment

typefaces (vs. unit spacing) and were capable of justifying a line of type. Now that you think about it, man has probably spent millions and millions of dollars just to figure out how to justify a line of type.

Did you ever set a paragraph of type by hand, and justify each line? You would put in a 3-unit space, then you take it out and put in two 5's, then a 5 and a 4, then you start using brass—all to achieve justification. Just to justify the line. Why? Because the eye wants to see it that way.

This was what we were doing on the DSJ. There were two typings. We would type the line the first time, then it would be justified on the other side. You would re-type the same thing, except the second time it would adjust the line and justify it.

So you had to actually type the line in twice?

You had to actually type it in twice yourself, which caused its own problems. If you inaccurately typed the line in the second time, then of course you were in trouble. If you put an "i" instead of an "m," and you used the same increments, you could go back and fix the character.

What ended the cold type era at Varityper?

The big year came, 1961 when the IBM Selectric Typewriter was released. That was the end of everybody in strike-on typesetting. There was no more business for us. IBM had come out with a similar machine to ours, except they were using the golf ball, which made it a snap to change the typeface. [See figure 6.11, PAGE A.13] We were finished.

Another factor to denote in the demise of cold type at Varityper was the severe competition of the Justowriter, manufactured in Rochester, New York. This was a set of machines that was capable of automatically setting justified text using paper tape as the vehicle to produce the final product. Text could be set on a machine called the composer, which

would produce a paper tape. This paper tape was put on the second unit which would produce the justified text.

Where did the company move from there?

It is important to note that Varityper Corporation tried to serve two masters by staying in the traditional market, as well as moving into the world of phototypesetting. As late as 1966, the Varityper Corporation was still making improvements in its basic machines. It must be remembered, that all these were keyboard machines, and although we had some suppression of keys—for periods, and commas—basically it was a strike-on machine and with a mechanical keyboard.

In 1966, the Varityper 720 was released (the 720 stood for the address on Frelinghuysen Avenue, Newark, New Jersey, where the plant was located). This was basically adding new skins to the old Model 660 strike-on machine. In other words, a face-lift to bring it up to the times, but still with a mechanical keyboard.

Not until 1968, did we release the Varityper 1010. This was called the "feather-touch" model, and the first machine to have a power keyboard. I must admit to you however, that this was a far cry from the IBM Selectric, or other electric typewriters of the day. In fairness, it must be remembered that the depressing of a key had to do a lot of things, including positioning the character on the font, and striking of the hammer to put the image on the paper.

At the same time we were developing the Varityper 720, it was decided that we had to get into phototypesetting. Other companies had second-generation machines out, but none in the price range of what the IBM strike-on MTSC unit could offer. So the low-priced, second-generation machine market was wide open. Although we knew others were working on such machines.

The first second-generation typesetting machine to be released by the Varityper Corporation, now called AM International, was the AM 725, a machine made in conjunction with Photon, Inc. [See figure 6.12, PAGE A.14] Photon actually built the units using their logic and controller. The typefaces were mostly ours, as we struggled to develop a type library. The machine used a glass disc 5½" in diameter with three typefaces on it, with a master size of 4½ points and 112 characters per font.

The AM 725 was followed with the AM 747, [See figure 6.12, PAGE A.14] which was a two typeface machine, based upon the Photon Pacesetter series of machines and using the same logic as the Photon machines. This machine used a much larger disc, but the same artwork and consisted of only two fonts.

The AM 747 was followed with the AM 707, [See figure 6.12, PAGE A.14] which was the same machine with four font capabilities.

The AM 747 was the first machine using a logic developed by Richard Chevelin, expressly for AM International. All the type development work was done at Varityper, with the actual disc being shot, mastered, and duplicated by Photon, Inc.

The move to phototypesetting was bringing Bently back to the real world. He was back in the world of real letters and real machines. Now we didn't have any kind of spacing constraints and we could do many things we couldn't do before.

In second-generation typesetting, the image size on the disc was only 4.5 points, which is really pretty small. [See figure 6.13, PAGE A.15] We were blowing that up to 18-point. That is a lot of magnification to try to keep the integrity of the character.

I remember in an early machine, Bently spent a lot of time doing ratios to find out what the best point size was for the discs. [See figure 6.14, PAGE A.16] But also just as important was the face size for all the sizes. Since this machine handled all face sizes from 6 to 18-point, we wanted the best representation of sizes. matching its hot-metal original. We wanted to keep the truest measure of the point size range. It was just doing mathematical testing with typefaces, but measuring heights of letters. How big is a 10-point letter?

It is so difficult. Depending on what the design was, you could have a 10-point character, which was 80-thousandths high or you could have one that was 86-thousandths, the baseline to the x-height. It would all depend on what the face was. What are you going to do to it? How are you going to compromise it?

Did you use Photon's typefaces?

The first thing we had to argue about was who was going to design the typefaces. Bently was under the impression that the Photon typefaces were lousy. They had been done earlier for the Photon machine, which was really a newspaper machine. The typefaces they had were about 87 Bodoni's and 6 newspaper faces: News 1, News 2, News 43, etc. That was about all the typefaces they had.

Bently and I went up and spent a lot of time examining Photon's library. We were located in New Jersey and we would fly up to Wilmington, Massachusetts and spend three to four days at a time looking at Photon's artwork. I can remember they were white prints on photographic paper, 512-point, and punched with a hole for registration. [See figure 6.15, PAGE A.17] Photon would put the artwork in front of the camera and shoot the discs. The prints were stored in military-type bullet cans.

In our car we would take as many cans as we could and drive from Photon to the Rolling Green Motel in Andover, Massachusetts. We would spend

all day going over their artwork, character by character. We would go over every character deciding whether the faces were good enough.

The characters were done by different designers and we ended up finding many inconsistencies in an alphabet. For example, the "o" would be an awful design or there would be four versions of it and we couldn't distinguish which version it was supposed to be.

We finally decided that using Photon's typefaces was not going to work. We were going to have to design the typefaces ourselves, but we didn't have any equipment to shoot and replicate discs. The only thing we could do was prepare artwork and have it reproduced at Photon.

We had a Photon prototype and we were designing typefaces from it. We'd run them on the Photon and then we would check and measure heights and everything else to see what was happening. We didn't have any background in the result of taking a typeface and putting it through a lens.

What typefaces did you design for the Photon machine?

Of course what we had to start with was Times Roman, because that was the basic typeface. I think we redesigned Times Roman at least four times. We thought in order to get Times Roman to match a foundry specimen, you had to add dimension. You had to add to the stems of the character, so when it came out on the paper, the paper would take something away and it would look like it did before, but that didn't work.

We designed Times Roman with added dimension and then without added dimension. We went back and decided to design it one-to-one. We would have a 10-point piece of type, which isn't very big, and project it up to 512-point. That is a lot of dimension to blow up on a very cheap paper. All we were looking to do was to get an image for the designer to work with.

Also the original designer had put set marks on it so we would know that the character was accurate. Well, we thought they were accurate. We also found that the foundries had made mistakes as well.

The designer would start with the character image, make a tracing, clean it up, make another tracing and then cut it out of rubylith material.

What is rubylith?

Rubylith is a red material with a mylar backing. The designer would put the rubylith over the tracing of the letter on a light box and cut out the shape of the letter. The cutting would leave a red character with the rest of the sheet of rubylith clear. [See figure 6.16, page A.18] This work was done freehand, using x-acto knives with an image size of 512-point or approximately 8 inches.

My designers in Europe used the same material. I couldn't buy it in Europe and I used to have cases shipped from a company in New Jersey. All the designers in Europe cut their designs freehand. They would cut out the tracing, then they put the tracing down on a rubylith and cut out the character. Cutting out a character in 512-points makes a very large character.

The cut out letter was photographed and then it became a piece of artwork used to make the glass disc. At that time all of our discs were made by Photon.

The biggest struggle was to decide whether our first foray into the world of phototypesetting was going to be acceptable. Since all we had to measure our success was by the type, we had many reservations about how it would be accepted by the type world. It must also be remembered that the only way the type product could be judged is from the machine output.

We were using a phototypesetting paper developed by Kodak, which was released in 1966. This paper was a stabilization paper and was being developed in a paper developer. The paper was flaky—it was not stable!

You could run text at 9 o'clock and then re-run the same text again at 10 o'clock, and get different results. The text would be darker, or lighter, and the character stems would have expanded or contracted.

This Kodak product was all we had and we were to be judged by this result. No wonder management was anxious about releasing this as our first product.

But of course, we now had everyone as an expert. If Bently was not such an easy-going person, he would have said "Enough. The product is good and the paper is awful." This paper, when first released, had to be kept in the refrigerator to keep it from gaining speed and overdeveloping the type output.

At this time I can remember a historic meeting held in the general manager's office. He asked the product development manager whether the product was ready to go. The product manager went on a ten-minute discussion of nothing, until finally the general manager interrupted him, went to the blackboard and wrote—"yes," "no"—and said, "Which is it?"

The product manager continued talking, and never did check either. Thus the battle that went on for a non-type company to release their first offering!

Finally, we released our phototypesetting machine in 1967. The first machine, the AM 725, was pretty successful. At that time we were ahead of Compugraphic. Then they came out with their machine called the EditWriter and began to give us stiff competition.. It went on, back and forth, and back and forth.

But the AM 725 was quite a machine. Actually, I spent a lot of my time with it during those early days. I still can't believe I used to go every week to Photon. I was in charge of accepting all the machines. We developed a type test that we would run. It showed me test copy, then it was my decision on whether the machine shipped or if they had to build it again.

In retrospect it was crazy. Here was Photon, who knew more about the workings of these machines than we did. The final decision was based on nothing more than the type. All I was looking at was output. I would look at the output and on different days you feel differently. What looks good today, tomorrow would look pretty lousy.

It was amazing that we did that for years. I really got to know all the people at Photon.

Was Photon a good company to partner with?

Although Photon was very good at the technology, what they lived on was their patents. Everything that Louie Moyroud touched was patented. I used to say that if he dropped a piece of paper on the floor, there was a guy who would follow him around and put a patent on it.

Photon made millions. Anyone who came up with a phototypesetting machine, had to violate one of these patents to manufacture it. So Photon made millions of dollars just going after the patent infringements.

The Photon widths patent was the strongest one that they held, as it really controlled the method that all other manufacturers would use to select characters, and space them into lines. This patent states "means to select successively the characters and spaces and to represent the relative width value of each selected character . . . ." It goes on, but becomes very technical.

This patent was used many times by Photon. A suit against Mergenthaler Linotype that resulted in a $2.5 million settlement and a 1970 suit

against Compugraphic where Photon received a settlement of $1 million are two examples.

Thus it was smart on Varityper Corporation's part to become involved with Photon when developing their first typesetting machines. It goes to the old adage, "If you cannot beat them, join them."

Photon actually had control of this whole industry?

Absolutely. They controlled with patents. Louie Moyroud was brilliant. Everything he would touch, Photon would patent, even though they didn't know if they were ever going to use it. He was an idea man.

The segmented disc was Moyroud's idea. He actually went out and had one done. It was not that they were planning on producing it, but the purpose was to patent it so nobody else could do it. If someone could do it, then they would pay royalties to Photon. For years they lived off their royalties.

We were actually in bed with Photon because we were making our machines there. Eventually we knew that we had to get out of this and start making our own machines. The first machine we actually came out with on our own was the Comp/Set in 1974, which was a fantastic machine. I think it took two years of development. [See figure 6.17. PAGE A.19]

Engineering had three goals for the release of our own machine. The first one was to avoid all Photon patents. The second was to use silver paper, not phototypesetting paper—it was to come out with an inexpensive silver imaging paper, like a thermal transfer paper. The third one was to be under ten thousand dollars. It did none of those things.

Well, there was one patent we kind of fudged on, and silver paper was never developed. The companies were going to come out with it, but they never did, which became another disaster for us. I was trying to design

typefaces to be exposed on silver paper in the experimental stage. We would receive rolls that were silver, just like film. There was no chemistry involved, it just came out of the machine developed. It was ridiculous. The paper was so coarse that the serifs would just fall away, even with Times Roman.

What were we going to do now? Were we going to go back and redesign all these typefaces? Fortunately since the paper never really developed, we just used normal phototypesetting paper. At least we were able to sell our type line and use most of it for our own machines.

Because we were so far set with the typeface library field and all of our typefaces had already been made to Photon standards, we now could not go back and redesign the library. [See figure 6.18, page A.20]

The Photon was only 18-units fixed. Compugraphic had designed typefaces with a 36-unit system and they had half-units. Even with 18-units, it was not really good enough to design a typeface. We were still sacrificing quite a bit of detail in comparison with foundry type.

If you are starting with a 12-point alphabet then trying to convert it. you are dealing with an alphabet that isn't pure. The designers on the Linotype machines had to condense and change characters for their unit spacing. Now in 18-unit phototypesetting, we can take that condensed "w" and make it back into its full width again.

Bently did everything based upon a 10-point alphabet. With a 10-point size there is a pretty good chance, unless it was really an extended face, that everything was going to be as good as the designer made it.

It was an interesting situation that all through Photon's history, their typefaces were always undersized. If you ran something on the Photon machine in those days in 12-point, it looked like 10-point.

Part of this was due to the conversion of metric measure to inches, as well as Didot points to the American point system. But another very important reason was that the beginnings of this development work was done in France, by the Lunitype Corporation, which was the French wing of Photon. A design studio there did all the early type design, under the leadership of Ladisus Mandel. Since beginning in France, accented letters were a very large consideration, which tended to make the master image smaller.

As an additional note, Adrian Frutiger was engaged as a consultant, which is why the Univers series of typefaces as a very early edition to the library. [See figure 6.19, PAGE A.21]

The French camera was eventually moved to Photon in Wilmington, where it continued to be used. When AM started making typefaces for the AM 725, Photon had to build a camera to shoot these master discs.

The cameras were like rooms, as the artwork was basically an 8½ x 11 size, and it was reduced to a 4½ point size image on the actual disc. The discs were glass, to assure that it was stabilized. The master was shot, and checked, and then a master was used to duplicate other discs for production. It must be remembered that each disc had 336 characters, or three rows of 112 characters.

In shooting the master, an operator and an assistant would put the character for each row up on a board with pin holes, then the images would be exposed, and followed by another set of characters that would be mounted. The master disc would be slowly advanced as each set of characters was shot, until all 112 characters were exposed on the glass disc.

As mentioned before, this master disc had to be copied onto a negative, to create a production master. These master discs were actually vacuum nickel-plated on glass so the could stand the rigors of copying many

times. Once this master was imaged, another vacuum nickel copy was required to continue to manufacture production discs for sale.

Was the Comp/Set similar to the AM 725?

The only similarity of our Comp/Set with the Photon-made machines was that we used the same glass discs. It was a Photon/Kodak product. [See figure 6.20, PAGE A.22] Kodak supplied the glass with a film emulsion. Photon cut it in a circle, photographically exposed it, and then ground off the edges. Heat is generated when you cut glass and it was pretty tricky to cut it in a circle without exposing it. The photographic discs would easily be scratched. You would just set it down and it would scratch the image.

Then Varityper Corporation went through some management changes. The engineering head decided we didn't have to do the glass discs and that we could use a film product. It was ridiculous. Now when you put the film on the machine, it wasn't stable. We could actually buckle the film, so you would be changing the focal distance between where the character should be when it was exposed.

What was the relationship between Addressograph-Multigraph and Varityper Corporation?

Varityper was the smallest part of AM. It was not only struggling to keep its autonomy, but also to make money. I think we were actually carried by the rest of the corporation. They were manufacturing offset duplicators and making big bucks.

AM thought they wanted to be in the typesetting business, because they could see it as the perfect print shop. They had the typesetting here, had a duplicator here—they would keep bringing in machines that did different things.

They brought in a keyboard entry system, which was just absolutely horrible. It didn't work half the time. We became involved with it. Why I,

in the type department, was fooling around with this keyboard, I don't know. I think it was related to using punch paper tape.

Which is another thing we all had to be experts at. I used to be able to read punch paper tape. I had to know what characters they were. When the machine wasn't functioning right, you would go back and read the tape. Often it wasn't the machine's fault, the operator had punched in the wrong keys. If you put a flush-left, flush-right, and a colon, then you wonder why the line didn't justify.

Photon did paper tape the opposite of us. [See figure 6.21, PAGE A.23] It was mirror image. I think we had the 8-bit on the right and they had the 8-bit on the left, or they only had seven channels. That was how we probably got involved in keyboards, because it was a paper tape keyboard. It all fell into the typographic department. We were involved with all the good things, because of the widths of the characters.

What were some of the other areas that you became involved with because of type?

Before they had machines on the *Queen Elizabeth II* [*QE2*] we had a situation where one of the London papers, the *Daily Express*, wanted to have a transmittable newspaper on the ship.

I don't even know how we got the project in the type department, but Bently and I worked on it for a month and a half. Finally, we were able to transmit a 5-level code, which had to convert to 8-level code, that was printed out on a typesetting machine. Apparently, we had the first transmittable newspaper.

What did that have to do with type? It was one of those things that nobody else was going to do. It was just making an analysis as with the languages. First we received the Bardot code in 5-channel and figured out what the alphabetic equivalent of the character was supposed to be.

What we didn't want to do was to have a code that said it was an "a" and then transfer it to an 8-level code and find out the code didn't represent an "a."

It was successful and it was really a fun project.

For what other markets was the Varityper used for?

We also had non-type projects. [See figure 6.22, PAGE A.24] We did chess characters for the chessboard. That was another lesson I learned.

Apparently, there is a precedent for keyboarding chess. There was actually a way that certain characters were expected to be on different keys. For example, I think the knight is supposed to be on the "q." We found out the hard way, we had made the whole set and it didn't work, but it was a fun job for the designers because they were actually able to create.

We did "specials" for people. In the early days at Varityper, we had a wonderful contract with Hallmark Cards. We designed all the script faces that were used on their greeting cards. They found that was easier for them to have the scripts done on the Headliner.

Instead of using artists, they would send the designs to us. Because these were greetings, it was easier to set the type than having an artist design the calligraphy or letter art.

Their artists would actually design the alphabets. They weren't always polished and we would have to do some work on the letters. We would then make the restricted films on discs and send their artwork back to them. We couldn't sell these alphabets to anybody else, only Hallmark.

We did some fantastic scripts and casual faces for them. It was really fun when specials came in because the designers really enjoyed working with that kind of creativity.

Did the machine also have legal applications?

Some of the other alphabets we made were to be used in legal documents. When you changed a legal document or updated it, you had to leave the text in the old document with a line through it.

It was so what had been changed could be seen. We had to actually design a type font with a line through every character. When you rewrote the document, you would use that font.

It was great on the Varityper because you'd have one font with the strikethrough face on it. As you typed the document you would type the changes in that font. You'd then swing the carriage around to bring the regular typeface into play and type the updated text. You could do the whole document in the same face and half the text was coming out with a line over it. It was a feature people wanted.

It's amazing that all these different applications for the Varityper that people have forgotten about. If it wasn't for somebody doing an actual design, it never would of happened.

Did you design italic versions of typefaces as well?

There was another battle we had when phototypesetting first came out. Some companies decided to do some tricky stuff. "Well, we'll make it roman, then we'll just make the italic with a slant." They thought it wouldn't make a difference. Except what they didn't realize was that an italic is not really a slanted roman.

A friend of mine who does typesetting says there are actually fonts now with small caps. The place where he works, the people don't know what small caps are. It's another whole feature that's gone away.

Small caps had a purpose. It was a whole designed alphabet that were all the same weight as the normal sized capitals. You just can't take a capital and size it down to make a small cap out of it. It doesn't work the same. It really is not the same dimension.

It is just like we talked about with the rules of typography, small caps, old style figures, and line lengths—all those things had meanings. These ideals go away when you talk about slanting a roman letter and designing it so the whole thing is just a jumble.

Many people don't understand where type comes from and the whys behind it. The most important thing for someone to understand is what designers went into when they sat down to design a typeface. Why were they doing it and the historic reasons behind it—like serifs are on letters because the way the pen was held when the letter was written.

For the Varityper, did you ever use ligatures?

Ligatures—there is a typographer's influence. Bently had to be there. Varityper actually came out with book fonts that had the ff, fi and fl. On a few typefaces they put them in place of the pound, the number sign, and the German umlauts.

Ligatures weren't a standard?

Bently would only put those on faces that would be used in text. It was on the Bodoni and it would probably be on the Clarendon. They wouldn't be used on the more commercial typefaces such as News Gothic.

Were accents a problem?

On Varityper typefaces, we used to design and include the accents. On the first font that was made, we would include all the accented characters. When the mold was actually engraved, instead of using regular low-

ercase "e," we would use the "e" with an acute. It would be on the font in position over the lowercase "e."

This enabled us to use the same mold and when the font was made, we could grind off the accent. It was easy to do and saved making probably six different molds. We could use the same mold, because if you didn't want the accent on the "e," you could just take it off. You could always take characters off, but you couldn't add characters on.

You must remember that we were also developing fonts for our international market, thus we needed the accents for the major European languages. This is where the coder came in handy, because even though the font was the in the same relative order, we could vary the keyboard, and width escapement.

I remember that a Spanish font was made and the n-tilde was left off. The whole font was actually made and produced. Somebody was doing tests and said, "Where is the n-tilde?" In those days all the characters were written down one after another with the numbers.

They had just left it out. So we had to go back and redo the whole mold and decide which character to delete and replace with the n-tilde.

In all the Varityper fonts we ever made, we always included the English pound sign in the character set, again because of Bently. It was a good character for us to include. When I went over to Compugraphic, they hadn't included it, because the English pound sign is not an American character, it is only British.

If you didn't have it, you really couldn't sell your filmstrips to the English market, because they wouldn't have the prime character used for their currency. Just think about that. You can be so far off the mark just because you leave off one character. Now you would have to go back and remake all those filmstrips or fonts.

What about old style figures?

On the typesetting machines, yes. We would go to old style figures for text. But it just made it more complicated because it was on a filmstrip, or a disc, or even a digitized format. How did you carry the float, or different set widths? You had to decide whether you were going to carry it and which fonts you were going to put them on.

We all had a problem with the "1." The "1" was the big problem because nobody seemed to realize up front, what are you going to do about it? What you wanted to do, no matter how you did it, is to have the figures all to be the same unit value, so you could have a line of figures for tabular matter. The "1" never fit that criteria. All the companies that I worked for had to come out with alternate "1"s. The problem was with the use, text versus tabular matter.

What we first did as a software fix, we just changed the unit value for "1." It became the same unit value for all other characters and it floated in its unit. It was great for columns of tabular matter, but not a great solution for text, where the "1" should appear evenly spaced with the other numbers of the typestyles.

What method was used to keep track of the character designs?

We did so many other special characters for special applications. Another problem was that we had to have a librarian to keep track of the fonts, because every character had to have a number. You would have fonts that would have five or six hundred characters. [See figure 6.23, PAGE A.24] What you wanted to do if you designed an alternate "1," you really wanted the alternate "1" to be character 650 on every font. You could pick up a sheet and look at it and say, "Oh, yeah, we did the alternate '1' for that text."

Since these were characters that you designed as you went along, the librarian would put the alternate "1" in position 540. You would pick up the sheet and say, "Oh we don't have the alternate '1.'" You would make one and then the librarian would put it in at position 600. You would accidentally end up with six alternate "1"s and never even realize you had done it.

This was in the pace of getting the job out tomorrow. The designer would put the characters in to be catalogued and really couldn't anticipate where characters were going to be placed. We were constantly doing all kinds of language characters at the same time.

Chapter 7: Varityper Corporation, Europe

Did you have a lot of influence on the type design process?

It was when I was in Europe that I really got more involved with re-designing typefaces. The way this transition occurred, I had been working as Bently's assistant in the United States for five years. We were just starting to develop the European market and had distributors all over Europe. The Germans said they could not sell our machines with the type quality. They recommended that we needed to design typefaces for Europe.

It was just a question of me being in the right place at the right time. A person from Engineering went over to Germany and was really knocked. "We can't sell the machines," "They're terrible," and "The typefaces are awful."

The Head of Engineering said, "Well, there's a guy in the type department that seems to know something, so let's get him to do it." The Vice President of International said, "Bring him out there so I can resolve this problem, let's go."

Varityper hired three Dutch designers and we started re-designing everything. We re-designed Times Roman. a German version of Garamond that they liked, and an English Baskerville. The Mergenthaler Linotype Baskerville is an American version of an English face. The two of them are so different.

That's what we started doing in Europe, re-designing all the typefaces. I had a satellite operation and all we did was design. I had to send the artwork to America to reproduce, to make the disks and everything else.

When I first went to Europe, I was very interested in what was occurring in the European market. When I went to Amsterdam Lettergergii and talked to Professor Ovink about what we should be doing with typefaces. I felt that I didn't know enough about the market and I wanted to see what we could do. We were going to be in Europe designing typefaces. we should at least be rendering culturally acceptable typefaces.

There I was, an American in Europe, and I really wanted to find out what he thought we should be doing there, what we should be developing. We had a very good relationship for a while although nothing really became of it. We ended up in hot water with him because we stole one of his typefaces and renamed it.

Were these foreign languages designed by other companies?

Monotype Corporation was probably the largest language manufacturer. They were the ones that did the most of the original character design.

Monotype was number-one in the United Kingdom, because they were everywhere. You must remember the sun never set on the United Kingdom. They had large subsidiary offices in these countries and were able to do the frequency studies on weird languages like Amharic.

Monotype would actually send documentation back to the home office, have the designers plow through it, come up with the character studies and then develop what characters were needed for a character set. Now when all the characters are present and you just need to figure out how to get to them.

Where did the inspiration for the typefaces come from?

Out of all the typefaces we have created in Europe for Addressograph-Multigraph or Compugraphic, we really didn't create a lot of typefaces that were new. What we were doing was creating typefaces that had come from a different era. It was really just reinventing. Every time a new machine came out, depending upon the mechanical specifications or limitations, you would find yourself reinventing again.

How did you create the different typefaces?

Generally there were not that many typefaces created differently. The typefaces we did were just in different languages. I think we were on the

marketplace before anyone else with Times Roman Greek. I had the Dutch designers do it. They created it by taking the Greek characters and following the Greek letter shapes and adapting it. We had nothing to go on at that time.

We had a Greek dealer who said, "I want a Times Roman Greek, it's very popular." I said, "Ok, good." I went to Athens and I said, "Let's go see what Times Roman Greek looks like."

So we go to shop number one and they showed me a book of a sans serif face, "That's Times Roman Greek." I went to shop number two and they have some weird looking thing, "That's Times Roman Greek."

I went back to the Greek dealer, "What do you want? We've now been to ten shops and we have eleven choices of what Times Roman Greek is. We're going to go to marketing, we'll make Times Roman Greek based on Times Roman." Which was just changing the shapes.

How did you choose the names for the typefaces?

We used to struggle to come up with names for typefaces. There was a typeface, Sabon, which was done as a joint venture by Monotype, Linotype and Stempel. It was going to be available by the three different manufacturers under the same name. Of course nobody else called it Sabon because you couldn't license the name.

So we named it "Berner," which was the designer's name. This was a face I tried to license from Stempel/Mergenthaler (they were the same company). Stempel claimed that they were still claiming royalties to the widow of the designer, so we came up with an AM name, Berner. It was a pretty clever name because it was connected to the name of the designer. It had a historic connotation, it meant something to us.

The Europeans took a typeface and called it Grigat, after Harry Grigat, who worked for our German subsidiary. It was a nice gesture, because it meant something to the AM people, even if it didn't mean anything to anyone else.

What about the licensing of typefaces with so many companies in the market?

Typeface licensing was a big issue in those days. We had companies like Monotype and Linotype who had Helvetica, Baskerville and all the popular typefaces in their name. One typeface that nobody could get was Helvetica, because Mike Parker who was in charge of Mergenthaler at the time, refused to license it. They were making money on it.

Another job I had in Europe was attending meetings and fighting to try to become legitimate. People were just awful to people. It was one thing to steal a typeface, but to steal it, botch it up and make it look terrible was awful.

The Stempel typefoundry did a whole series of posters on one typeface. We at Varityper AM would emulate it. We made a set, by blowing up our artwork letters and make a poster of our version of the typeface. It was a constant battle. At AM, we did fairly well, as we called them by other names.

One of my projects in 1985 and then again in 1988 was a cross-reference listing of all of the companies in business, called *Typeface Analogue*. There were so many that I can't acknowledge all of them. I listed all the original typefaces and a sub-listing of the other versions of that typeface by competing companies.

There was a big debate on whether Helvetica was really Helvetica or was it Akzidenz-Grotesk or even a similar face. Helvetica was actually designed by a Swiss named Max Miedinger. [See figure 7.1, PAGE A.26] Akzidenz-Grotesk was designed for Berthold by a German. The typefaces are very similar.

Those are only two of the iterations. IBM came out with Sonoran San Serif, which was very reduced. Compugraphic re-designed their faces called Helios, because the first Helios was awful. They actually had Helios and Helios II and then they came out with CG Triumvirate, which was a re-designed Helvetica. [See figure 7.2, PAGE A.26]

So most of these typefaces were very similar?

Some of them were good and some of them were bad, depending on who made them.

Weiss, a foundry type from Bauer, is an example face. When Weiss was first designed, the way you could identify it was by the capital and lowercase "s" which were actually upside down. The typeface was released that way and it became the identifying character.

Finally they went back, maybe 15 or 20 years after it was released, and corrected the "s." At that time we accepted the fact that the "s" was upside down. It was most likely designed right, but somebody must have turned the mold over and then they cast it. Because it was Weiss, w-e-i-s-s, the two "s"s at the end were upside down.

Hermann Zapf was once asked why he seemed to take liberties with the "z." He said, "Because that's my character." Have you ever seen any of his "z"s? The "z" is always the one he goes crazy on. He can take liberties with it because it is part of his name. It's not a frequently used character, so who is going to complain about a "z?"

Hermann was really bent out of shape that everyone was stealing his typefaces, especially Optima. It just really frustrated him. We would go to Association Typographique Internationale [ATypI] meetings where manufacturers would greet him, "Hi Hermann." He would say, "You! You! You have cost me all of this money because I have no royalties, because you don't buy my typeface, you steal it."

I think he was carried away with it, but he was right. He was trying to make his living designing typefaces and as soon as he came out with one, someone would rip it off.

American Type Founders' [ATF] Americana is interesting face, because Americana has a character called the interbang. The interbang is a combination of a question mark and an exclamation point. They designed it specifically for that typeface, so only a few people actually used it.

In those days, the only reason you created typefaces was to meet the demand. If you had a typesetting machine and someone came and said, "We want Americana." Of course you would talk to the salesforce and they would say, "We could sell a hundred machines if you make Americana." We would design the Americana and it would sell one machine. It was interesting.

Something like that is almost completely dead now. There were typefaces out there that I couldn't even tell you where they came from or what the sources were, but they had no connection to anything.

At the end of my career, it came back full circle. Unitex, a spin off of Itek, was in the large system publishing business. They cut a deal to cross license typefaces between Monotype and Itek. They looked at the type library at Monotype.

What you have to remember is that they weren't designing letters. They were doing the same thing we had been doing, paper copies on a pantograph. They had mechanical drawings, but they didn't really have original drawings—the drawings that you would take and say, "That drawing was done by an artist, isn't that wonderful?" None of those existed. I was really shocked.

How would you choose the specimen text?

It was another whole battle in the trade. You designed a specimen, what were you going to use for text? We used to have big discussions about what the text should say. Should it be something that makes sense or should it just be a bunch of words, because you want to show off all the letter combinations.

The specimen text we used for language variations in the Varityper books, or any specimen book was another curious story. It's impossible to come up with a text selection out of a book. so frequently biblical passages were used. The Bible was translated into various languages, so for the text you would use the passages to show off your version of the typeface. It's interesting that's the only text you could find that was commonly translated.

Would the letters change when the sentence was translated into another language?

That's right, it changed the whole thing.

In other languages, the accents were another problem. If you wanted to show off a text, you wanted to use all the accents. So now you had to have a sentence that would use as many accents as the language had. Who was going to do that? It is very difficult to achieve.

How did you handle the accents?

But based on the language, the high frequency of accented letters would be full characters, with only the minor accents being floated. It must be remembered on a French keyboard, you push one key to get an "e" acute or grave. In American programs, they put the accents at the end, which is where we put the program patches.

What is a patch?

A patch is a change. The programs were created on paper tape and changes to programs were usually put on the end of the program. Since we were adding to American programs, we put our accent routines on the end of the main program.

Because America did the main programming, in Europe we had to put the patches in or alter the program to make it run for us. We had to patch them for different country uses.

Every time they came out with a revision in America, they would just write it over our patches and then the European programs wouldn't work right anymore. We were constantly dealing with this. I spent most of my time just travelling back and forth between Europe and the United States. It was really so frustrating because they just didn't understand what we were doing in design.

How were the character sets for these languages determined?

When I was in Europe, the character sets were another thing we had to decide on. The character sets for European languages were larger than for the United States. When Americans made a machine, they would make it the way they thought everyone else in the world wanted it. They didn't really know what everyone else wanted.

The Americans didn't do any initial research?

They did some, but they would determine that only certain accents were needed in a particular language, and that's all they needed to do.

When I went to Europe, I spent my time talking to countries asking, "What characters do you want?" If you go back to the Linotype machine, the characters ran fine on a Linotype machine. In fact, I was surprised to

find out in a Linotype machine in America the n-tilda in Spanish was not a font or character which runs in the Spanish Linotype magazine [holder for font matrices]. It runs as a pi character. The Linotype operator has to take the backspace and manually plug in the mat, so the character becomes one.

While I was in America, another wild story was regarding a phototypesetting machine we created to set in Polish. We thought we could get the Polish market in Detroit, where were a lot of Polish immigrants. We created a disc with all of the Polish accents.

We came to find out that this company had old Polish women who were familiar the normal typewriter keyboard and thus were typing all the Polish characters without using the keys for the accents. They would then go back and add the accents in by hand, which was quicker than teaching them how to find the keys to strike for the accented characters. So the whole project never worked.

What else was important to the European market?

In Europe you get into this traditional thing of "We need to have." There were other requirements besides characters. There are certain symbols in each country which they believe they need to have, so you try to figure them out. You have a character set with a certain amount of characters and once it is on a piece of glass, or disk or filmstrip, you can't change it very easily.

Even when we went over to digital, you still had to make font files. They worked a certain way. You have to remember that I am in the past, so I'm sure that has all changed now.

What companies like Bitstream do now is have a character collection. All the characters are there in the master set—you can get any character you want. But in my days we were limited in our character sets.

It's hard to realize that the little things were so important. It also reminds me of the conflict we used to have with the engineering department. In all engineering, probably even today, you have engineers that generalize plus or minus 10,000, or an inch, or whatever.

Bently used to say, "The only difference in the type design business is that we can't be plus or minus anything." When we designed the character, it had to be exactly what it was supposed to be—not plus or minus half a thousandth or anything else. Otherwise it would not be what it was supposed to be.

So in type design we don't have the engineering option of designing with a given tolerance. Our tolerance is zero. Not only is the tolerance zero, but when you multiply by 180 characters, you have to have 180 characters with a tolerance of zero. It makes it a pretty perfect world that you are trying to create and we don't have perfect worlds.

Addressograph-Multigraph was locked into that 18-unit system because they were tied to Photon. AM had a whole library of typefaces in 18-units whereas Compugraphic was going in 36-units and Berthold AG came out with the Diatype at 54-units. Really all you are doing is taking the same character and the same set and just dicing it up into smaller dimensions.

When I was with AM, my designers in Europe said to me early on, "Look, what's the big deal with 18-units? We can make this thing in 36 just as easy, it's not going to change anything. The letter character will be the same size, it's just the way we will express it." Each unit would only become half of what it was. Overall, it really was the same thing.

With any design when you fix it in the unit system, the only decision you have to make is whether to put the character dimension in a little box or pixels. The only effects are at the extreme edges of the character—is it white or is it black? The inside of the character is still going to be the same. [See figure 7.3, PAGE A.27]

Those were the decisions we were making. We were adapting what somebody did hundreds of years ago and changing the fixed curves of the character. It was a lot of optical judgment in the design of letters.

But as machines move on, because of digitization, I don't know anybody that actually had two masters, a text master and a display master. They just stayed with one. There it was an 8-point and maybe a 180-point, and it was the same character just enlarged or reduced.

What measurements were involved for calculating the typeface parameters?

This calculation sheet was done for the AM 747 phototypesetter. At that time the machine only had the sizes from 6 through 18-point. It was French so we had to take in account the accents.

For example taking the 6-point size [See figure 7.4, PAGE A.28], we had done all the measurements, the accents to descenders, which leaves this white space between the lines, which converts to this paper feed on the machine and then you convert it to Didot, and it comes out to 0.1036 inches.

Bently put together this chart was for the Megaron font, which was our Helvetica. It is a typical example of the kind of work he would do. How long do you think this took him? He measured every point size, capital to ascender. given the white space, how much the paper advanced, what point size it was in Didot, and finally converted Didot corps to inches.

Apparently we had a problem with delivery or a font problem. Whatever the problem was all I know is that when he sent me this, I still couldn't believe all the work that went into it. Show that to anyone and it will boggle their minds.

Did you have problems with hyphenation?

We were involved with the hyphenation routines for all the languages. We called it H&J, hyphenation and justification. The Americans had

determined the American hyphenation, but we did not have European hyphenation programs. We really needed to do European versions, not an American one, because we needed to do it from perspective of the actual languages.

It was like my searches across Europe, you would find somebody to say, "Well, how do you do French hyphenation?" Even though French typesetters had been setting type all their lives, they didn't know anything about hyphenation. It was ridiculous.

We went to the universities and we talked to people we thought would know. It is interesting, we would ask "Well. what do you know about French hyphenation?" "I know everything." Because they were not going to say, "I don't know anything." They were all experts.

It was unfortunate that people couldn't say. "Gee, that's interesting, but I really don't know anything," or "That's not my field," or "I've never thought about it." But instead of that they were coming over with information which made them look like they really didn't know what they are talking about. We said, "That's wonderful" and wrote it all down and destroyed it. It was an unique aspect of the whole business.

I don't know how we ever found David Riggs from New York City. He was able to do these hyphenation programs. Finally, somehow we found the rules, which I think was from a selection of people who submitred different items. [See figure 7.5, PAGE A.29]

It was an awful job, but here we were in the world of type design and we were involved in hyphenation, which is actually the back end of it. But we had to do something about it because it effected the type design.

German hyphenation is unbelievable. I never was able to figure it out. David had quite a job to do. German has two logotypes. which are the

"ch" and the "ck" logotypes. If hyphenation comes on those points, then the characters separate. The "h" carries over and the "k" carries over.

Now how do you do that? If you are carrying it as a logotype character on your font, how are you going to separate it for hyphenation purposes?

The "ch" and "ck" logotypes that we were designing were going to run on the fonts. David said, "Well, we can't really run them on the fonts if we are going to hyphenate them." Also the "ch" logotype and the "c" and the "h" were not the same, because the characters were squashed together. It's kind of like a logotype, but if you wanted to follow through with a design and the foundry version, it's a different character.

There are even different rules for typesetting. In German, the letter "s" becomes an eszett, ß, or a double "s." They keep adding on to modifiers to make the word. There are certain rules where you cannot break the word, you have to letterspace it. You have to letterspace it!

Out of all the hyphenations, German was the most difficult and French was fairly easy. I have the book, *The Manual of Style Rules of French Typography*. It is all in French of course, but it is really a very good book on type, at least of the French hyphenation rules.

We were on a quest to put the European hyphenations together for the DRUPA, which I am thinking was in 1972. We took typesetters to the show and we actually set text in German and French.

Were the European key positions in the same arrangement as the American ones?

On the European keyboard, the figures are in the shift position of the lowercase. The figures on an American machine are run on a different shift. Figures on a typewriter usually are on the shift of the first row keys.

The Germans don't use the same keyboard. It's not q-w-e-r-t-y, it's q-w-e-r-t-z. And of course the French, it's not a "q" at all, it's a-z-e-r-t-y the first key is "a." It is based on the frequency of their keyboard. [See figure 7.6, PAGE A.30]

This did not make a difference in the characters, but it made a difference in the program. They have to key back the key number to the key character, the "a" is the first character in a different position. We had a figure shift, where these figures were on the shift of a different row of characters. The software wasn't designed right. Getting the proper characters in the right places was a software problem.

I don't know how other companies solved them. As an American company, unless you were there talking to Europeans every day, how could you ever find out these things? The Europeans would give you a piece of their mind no matter what. They all knew their characters, they were all "experts." Half the "experts" were pretty green, so it was really searching your way through to find the "real" expert.

What were some of the projects you were involved in while in Europe?

Generally in a company, you deal quite often with salespeople. My first day at work in Europe was one such example. Based on our typeface strength, the salespeople had sold a machine for Dutch film titling. All the movies in Holland are subtitled with a square [serif] typeface called Rockwell.

A salesman came into my office and said, "We have this project and you need to design a roman and an italic for film titling." I said, "I don't know what you are talking about."

I went down and visited the plant where they did the film editing for Dutch. What they actually did at that time was making clichés, which were the same size as the 16mm film. These clichés were made by a metal

plate, which was pressed right into the film emulsion. They would view the film and insert the clichés in the proper place for the number of frames required. The film reels would move around while the same text plate was pressed into a certain number of frames.

The other thing we were concerned about when we were designing these faces was the monotone lettering. The dialogue was set in a normal style and spoken text was in italic. We were using a square serif, Rockwell, because it kept an even structure. We were unsure of the effect to the spread of the characters because we were actually pressing the type directly into the film. Again, we were selling machines on the strength of what these letters do.

Denmark

Peter Lake was an Englishman who ran our dealership in Denmark. I love going to Copenhagen, Denmark. We had another adventure with a company that made weighing devices in Copenhagen. Their major market was in China and they sold all over the world. We sold typesetting machines to them solely on the strength of the machines ability to do languages, hyphenation, and all of the extra stuff. Of course we couldn't do any of it.

It was fun to try and solve those problems, but the machines were sold for the wrong reason, which was frustrating. I said to a salesman, "This is crazy. There is no way we are going to sell these machines." "Well, we have to do it now. The machines have been sold and we have the money." It was a salesman's adventure and then they bring in the troops to fix it.

Foundry Olivé

I also met Mr. Olivé from Foundry Olivé. In fact I made a contract with Olivé to license all their typefaces and of course I couldn't speak French. It was an adventure to hire a French lawyer who understood licensing agreements through our French subsidiary.

I met Mr. Olivé at Marseilles to formulate the contract. It turned out that the lawyer I hired was a good lawyer and knew the language, but he did not understand anything about the world of type. It eventually boiled down to Olivé and I working up the contract ourselves.

Between my broken French and his broken English. we put together the contract. The lawyer cleaned it up and made it a proper contract. He had no idea about what we were talking about. I guess it seemed we were talking an unknown language.

It is really hard to believe that the normal world isn't aware of type. I guess it is just a specialty. There are probably no lawyers that specialize in type. It's the same idea with the copyright law struggle. It is a puzzle. Nobody knows what to do.

German Typefaces

Once, I went to Munich, Germany for a few days. Our man Harry Grigat, was a Lithuanian who spoke German. He had been raised at a time when Lithuanian could not be spoken or taught. He was a great guy. The type design group in Germany actually designed a typeface and called it Grigat.

They couldn't sell any machines in Munich because the type quality was so terrible. I said, "Now I don't speak German, I'll go as the American representative. We need a front man that they have never seen and we'll say he's the expert." One of the German salesmen and I went down to this typesetting house. We looked at the films with our loupe and ended up satisfying everybody.

Just by convincing them what we saw was good and that we knew what we were talking about, "Oh, yeah. that's good." "Oh, yeah, that is good isn't it?" Good or bad there was no way those machines would come out of there.

As I think back on it now, it was really funny. If the typefaces were bad, we would have done different designs, but they were as good as they were going to get. It was a commercial market and the machines been installed. I spent most of my business career going around on these wild typographic adventures.

Stempel

Since I was in Holland, I would go over to Stempel in Frankfurt. They were very active in Association Typographique Internationale, [AtypI]. René Kerfante, the International Representative, left Stempel and went to Monotype. When Monotype went broke, the type division was the only thing that was kept profitable. The rest of it all went to receivership and I don't know who owns it now.

The other involvement we had at ATypI was metric standards. It was a big issue for three or four years. Ernest Hoch in England was trying to come up with some way to work a kind of buttonhole thing and I was funding his efforts. We ended up being on the wrong side of John Dreyfus, who was the typographical advisor of Monotype. John and I went around and around on this whole metric thing. It finally blew over and everybody else forgot about it.

John Latham was in charge of all the type design at Monotype. I was trying to license typefaces and he would absolutely stonewall me. It was just awful. So I would go to Dreyfus and say, "Come on John, let's share the wealth."

Scandinavian Characters

We had a Scandinavian deal in which we were trying to get into Iceland. I went to Reikjavik to spend a week just talking to universities to find out what characters Icelandic people really wanted. They said to our dealers and also to me that no one had taken the time to find out. "You

Americans," they would say, "you Americans think you know what our characters are supposed to look like, but you don't. You do it all wrong, all the time."

We came away with some typeface design aspects for the Icelandic market. There were some characters that we thought were necessary. We would get those done, then the Danes would be unhappy with it and say "Oh, we don't want that." I don't think we ever settled all the arguments.

Iceland was really an interesting adventure. I really enjoyed it a lot. I don't think there are many people who have spent a week in Iceland for the express purpose of looking at typefaces and typeface design. I was astounded with the number of printing places and plants in that country. Do you know there are more books read in Iceland than any other part of the world? The market up there is really fantastic, because they people read so much.

Polish Characters

Another curious adventure in that same wave which was tied to AtypI. In the days of the Iron Curtain, the 70s and 80s, I used to meet a Polish gentleman, Roman Tomacheski, at AtypI meetings. He could speak German and Polish, his English wasn't very good, but he could get by.

Roman was very proud of the Polish characters and accents. I couldn't argue with him, he should know. Some of the Polish people were ridiculously puritanistic in specifying what their characters were suppose to look like. We did the best we could.

Since we were trying to serve a broad market, I would tell him, "You can not always have it your way. If you want to buy a hundred and fifty machines, then fine, we'll make it any way you want." We couldn't sell him any machines, we couldn't even sell machines behind the Iron Curtain.

There seems to be a lot of sensitivity with the translation of languages?

There is a lot of language sensitivity. We were talking to a fellow from Puerto Rico. He is listed on his business card as "Joe." My wife said, "You aren't Joe." He said, "No, but I am Joe in North Carolina." His name was José and he said, "I'm sick and tired of being called 'Hosie' and 'Whosie,' so I'm going to be Joe."

I had the same translation problem with Dutch. My name, "Bill," in Dutch translates to "rear end." So obviously there were no Bill's in Holland, there were "Will's" and "Wim's" and "William's," but no Bill's. We would visit friends and the kids would laugh at my name. It is just a typical example how one country has a different meaning that causes sensitivity.

Did you keep your name, Bill, in Europe?

That's the thing, nobody ever called me by my first name. I was always just called, Mr. Wheatley. Since I have been here [Asheville, North Carolina], I just use my last name. Everyone just calls me Wheatley. Half of the people here don't even know my first name. It just kind of evolved.

Scangraphic

Scangraphic was a German company that produced absolutely fantastic type specimen books. A lot of work went into them. "Hamburg fonts" was the best test words. You have rounds and straights in "Hamburg" and in the other half, "fonts," the "o" and the "s" are the best two characters because of the round and the straight.

I got very close to the people at Scangraphic because the sales manager, Rudolf Meissner, was originally a salesman for the German company of AM International, and left to become the sales manager of Scangraphic. All of their type designs came out of Europe, so they didn't have any of the International Typeface Corporation [ITC] faces and they wanted a

license to do the ITC faces. It came about through him talking to me and then myself talking to New York. We talked to Aaron Burns—one of the people who established the company—after that and they were approved to do the ITC faces.

The Dr. Boger organization had a regular typesetting machine, and in the early 1980's they renamed themselves Scangraphic. Scangraphic was never successful, but their machinery was really phenomenal. They were very sophisticated German machines and hard to operate. They had too many bells and whistles and you had to have the discipline to run it. It was like the Diatype. [See figure 7.7, PAGE A.31] Digitek—those machines that you could do anything with them, even mathematical formulas.

There were many buttons that you would have to set on the Digitek before you could do anything. If you set one of them wrong, then the whole job would come out wrong. It took the people who could understand it, but the machines were phenomenal and they had good quality typefaces.

It reminds me in a way of some of the stuff that Bently would do. It was always very sophisticated because he had the knowledge and he had the mind to do it. But it was not knowledge that you could easily pass on to other people and say to them, "Now go do it."

Berthold

For years Berthold came out with some fantastic typefaces and then they really deviated from them. Berthold actually had Akzidenz-Grotesk, which is the sister of Helvetica. There was always that rivalry between Berthold and other countries. As we know, Germans invented printing, and since they invented it, they had to do it the best.

At Berthold, a typical German ran the type program. He would march in the mornings and all the designers would come to attention. For years they were in fear of him.

I had a close relationship with Berthold as well. Berthold bought American-owned Alphatype and the companies were combined. For some reason, the combination went bankrupt. They pulled themselves apart and separated back into the two unattached companies. After that they never did recover.

German Telephone Directories

I'll tell you another short story about Germany—Varityper Corporation supplied the machines for producing their telephone directory. The German telephone directory was on lampartz cards, which were little tiny cards. Elderly German women typed the listings, put them on boards, and then they would be photographed. I think it was three sections—the name, the number and then the address. Every year we sold five hundred machines for the same project. We would use the same typestyles—it was a piece of cake. It was a beautiful order.

Germany was really stuck with this process. Instead of having the elderly women on pensions, they were paying them to type the directory listings. I think there were thousands of women who would work three to four hours. The country paid them for this work, rather than to have them sit at home.

All the other European countries were coming out with computerized telephone directories. Germany was still slugging around with lampartz cards, because they didn't know what else to do with all these women. You have a million women that you are paying a stipend for work, rather than putting them all on the dole.

But Germany finally changed over and of course that was the end of the Varityper. One fell swoop, we were completely out of the business. We had nothing to sell.

Iron Curtain Exhibit

We used to show exhibitions behind the Iron Curtain. They were always run by the closest country, usually Germany or Austria. We used to go to Brno, Czechoslovakia and set up all our equipment. It was just like a big show, but we would have a chain across the front of our building, so no one could come in the booth. It was amazing. Why have an exhibition?

But there was a reason for the limited access. Anything not tied down, would end up stolen. Not stolen to be vicious, but stolen it because it was American.

The way the show worked, we would receive a person who would show up with the paper for his delegation group. The group would then come into the booth, look at all the equipment, and then leave. That was the way we ran the shows.

We also would end up losing all the packing boxes at these shows. The large machines we were showing came in huge crates. The crates were not brought in, they were left outside the hall and they ended up stolen by people to live in. After that we actually had to have a guard on the crates, because to the Polish people, they were a more immediate need than the machines.

It was really a curiosity. We tried to have the majority of the machines sold, because we didn't have the crates for them if we had to ship them back.

Lebanon Dealership

I also spent some time in Lebanon. I was in Beirut, before they destroyed it and I've also been back after it was destroyed. That was the only really scary time I had—living in a hotel that was built underground.

We had a dealership of ours in Lebanon and they had to live underground. They were pretty good customers. They picked me up at the airport and I

spent two nights with them. When I was ready to leave the country, they really couldn't help me.

They had met me at the airport, but going out they could only take me so far. They couldn't go through customs. The official said that I had to pay for my luggage and he took all of my money. Well, I gave him all of my money, all that I had in currency. I had credit cards, but he didn't want that, he just wanted all of my cash.

What about your time working in the Middle East?

We really developed the Arabic character set by going to Egypt and Lebanon. The biggest bottleneck with the Arabic was to try to get three Arabs to agree on what you should do. I worked for *Al Aharam*, which is the big newspaper in Egypt. They spend a lot of money on research.

I spent time talking to people about how to make an Arabic character and what an Arabic character set consisted of. I had fifty different varieties of what had to be done in an alphabet. I have books on Arabic and Hebrew that I wouldn't read—I would just go through looking for the character shapes. [See figure 7.8, PAGE A.32]

I could see a letter and tell you that it is good, but I don't think I could design it. What we used to do in Europe is to put the characters up on the wall. We would look at them and what things needed to be fixed.

The trouble with Arabic on a phototypesetting machine is that they don't use spaces. They use what is called Kashdia, which is adding on to characters when you justify. In order to justify Arabic you don't use spaces between words you just use Kashida, which is extended between characters. It fills out the line.

It was a software problem. We actually ran the operation out of Belgium and it took us a year to develop the machine. We set Arabic into the soft-

ware program. We actually did the whole program without a machine, because it was still in development.

Finally, we did it on the AM 744. [See figure 6.12] It had four rows of fonts, so we had enough for the 448 characters. Then the American division decided they weren't going to make anymore four row disks, they were only going to do two row disks. I said, "Well how are you going to do Arabic?"

There is a phrase about having to read to understand instead of understand to read. The problem with Arabic, like Hebrew, is that all the vowels are not included. Hebrew has vowels that they put in for children, but the vowels are not used in normal text. You have to assume that you know what the word is.

The same thing is true with Arabic, but since the Arabic people aren't as well-educated, there are different versions. The newspaper Arabic, which I have seen run on the Linotype, was a ninety-channel Arabic, so it was really simplified. It was so basic that the less educated people could read it, but it was too simple that higher educated people wouldn't read it at all. When you get into a sophisticated form, an uneducated person wouldn't be able to read this form, because it would be a whole different language.

It is similar to the Chinese situation. The Chinese talk about their levels of education based upon how many symbols are known. The range becomes more complex as a person becomes more educated. For example, the college professor would know 5,000 symbols.

The written language has a lot to do with the culture of the Arabic people. If you go in a typical home, there would be a hand-done Koran on the wall. According to the stories I was told, calligraphers were the only people who were honored in Egypt, because they maintained the records. If a calligrapher died, they would put up a commemorative stone. If a king died, there was nothing, just a plain grave.

Not only is Arabic an alphabet, it is also an artform. You can combine one character with another. The sign of Allah is all one character.

The other problem with Arabic was a belief that the Arabic language should never be in printed form because that was the work of the devil. It should only be written by calligraphers and drawn from mind and heart and soul.

We actually set the first Koran on a machine, but they felt the devil was behind that too. We didn't want to have the devil's work on our hands, so in the future we had to be careful not to actually set the Koran.

One other thing about Arabic, I met Walid Tueni in Lebanon. When all the problems in Beruit came, he moved to Paris. He was living in the George V, a fancy hotel in Paris and I used to visit.

Walid was able to script a word in Arabic and then write the same word in English. If you are writing Arabic, you have to be writing it in the opposite direction. He would just reverse his hand and write. It was amazing to see somebody who could write Arabic then to write the Latin equivalent.

It was curious, because Walid was the only person I had ever met who could write both ways. In the early days writing went both ways. Except for a few languages like Hebrew and Arabic, it was only when Romanized that we continuously wrote left to right.

What were your closing days at the Varityper division like?

The International Engineering group in Europe was decimated. Curiously, they did away with all engineering. In a building for 350 people, we were left with five designers and two software people. We were there by ourselves, designing typefaces.

We moved the ping-pong table into a vacant office and we would play ping-pong every morning. We would be waiting for America to wake up.

It wasn't until two o'clock in the afternoon that it was nine o'clock in the United States. I can remember sitting on the floor in the corner talking to my boss, asking him how things were going, while two of my designers were playing ping-pong. It was a strange thing.

There was constant conflict between the Americans and the Europeans about running the satellite office in Europe. I found all the memos that I thought I would never want to see again. All the documentation was piled up and the frustrations went on and on.

What finally closed the European satellite was the decision "Oh, we will move the type design group in Europe to America." I had five designers and two software people in addition to myself.

I told them they were out of their tree. They were going to come up to a Dutch designer who had lived all his life in Holland and say, "Well, you are going to love it in New York." They would of liked that. It was the most ill conceived plan they ever came up with. Finally they decided to drop it.

Chapter 8: Compugraphic Corporation

What did you decide to do after the close of the Varityper satellite office in Europe?

Since I was still in Europe, I decided I would go to work for Compugraphic. I say in my career, I worked for all the have-nots. I worked for Addressograph-Multigraph, Compugraphic and Itek. They did not come from the traditional typesetting market, so therefore they did not own any typefaces. We had to "borrow" and "steal" them.

At Compugraphic, I thought I could do the same work I was doing earlier at Varityper. Compugraphic wanted an international presence, but they had a different kind of management. I never felt the love of anything at Compugraphic like I did at Varityper. They had a type department, but they were scientific about it.

At Compugraphic meetings, the marketing staff went through every monthly publication and generated a meeting list of all the typefaces used. It contained the number of the typefaces that Compugraphic had made, what the competition made, and what the market was using. It was a complete mechanical list—this is what people are using, this is what the competition has, this is what we need. From that we would plan our type. [See figure 8.1. PAGE A.33.] There was never anything to do with creating at Compugraphic.

Although there was one Compugraphic story about a typeface called Garth Graphic. [See figures 8.2–4. PAGES A.34–36.] Garth Graphic was named after Bill Garth, the founder of Compugraphic. The company wanted to honor Garth. We spent a year looking for an appropriate typeface, because we didn't want it to be from a type designer from the past.

We finally took a face called Matt Antique that was actually designed by John Matt at ATF. Matt designed a roman and half of an italic. Using Ikarus, an automatic font generating tool, a total family of Garth Graphic was evolved. All this from a basic roman and italic.

We put his typeface out and then the design began out all over the place. They're must of been twenty versions of that Garth Graphic. That was the memorial to Bill Garth.

I always felt sad about this. It was John Matt who had originated the type design, but of course he never got any credit for it, even after he died of cancer. There is an article in *Types Best Remembered, Types Best Forgotten* where I wrote about his typeface.

Matt Antique

The typeface that I would like to talk about is a face called Matt Antique by some, and Garth Graphic by others. The creator of both of these faces was a very gentle man named John Matt. His last position in the type world was with Triple-I, where he ended his life by going to cancer treatment 3 days a week, until it consumed him, and took his life.

His typeface with different names is a curious and interesting story, and one that I would like to see in print, so others can remember the man, and also have some appreciation of how typefaces used to be created.

The basis for both these typefaces was a design drawn by John Matt, when he was a type designer working at ATF, in Elizabeth, New Jersey. The designs were meant for a machine called the ATF B, which was an eighteen-unit second-generation typesetter. This machine did not have that long a life, and the machine was discontinued before this typeface was released.

Drawings of the roman, italic and bold were kicking around the offices of ATF, and came to the attention of Art Directors at two companies. These companies were Itek, Inc. and Compugraphic.

John Schappler, the Art Director at Itek, talked to John Matt about the face, and got permission to use his name for the typeface. Since the face was only in the drawing stage, the design staff at Itek had to draw additional characters, as well as refitting them as they were based on an eighteen-unit system, and could be broadened for use on the Itek Quardritek, a low cost second-generation typesetter. The result was a three face family of roman, italic and bold, called Matt Antique.

At Compugraphic, a slightly larger project was planned. Compugraphic was looking for a typeface which could be named after Bill Garth, the co-founder of Compugraphic Corporation., and a pioneer in the typesetting industry. They wanted a typeface of solid quality, and a typeface that would be a fitting tribute to a man—Bill Garth. They started with the same drawings that Itek used, except since this was to be a grand tribute, they created a major family by using URW's Ikarus System. The end result was a major family consisting of roman, italic and bold, as well as a bold italic, an extra bold, and a condensed and bold condensed. They also created small caps, ligatures, old style figures, as well as a full accent complement for all the major European languages.

It was certainly a wonderful tribute to Bill Garth, to have a typeface named after him, especially such a grand and expansive family. But I think it is a wonderful tribute and memorial to John Matt, who created the designs, to have one of his designs named after him, Matt Antique with the same design the basis for the tribute to Bill Garth, with a face named Garth Graphic.

—Bill Wheatley

Matt was another designer who never saw the light of day. His typeface was blown up into Garth Graphic. A friend of mine at Itek, John Schappler, took the design and actually came out with a version and named it after John Matt. At least he was credited from Itek, which is like getting credit from Joe-blow-typesetting company.

You had mentioned Futura and Hoffman?

That was a curious story. Alfred Hoffman was in charge of the Bauer foundry. I was working on a typeface book, which I never did much with, and we were talking about Futura, which was designed by Paul Renner.

The story goes, Renner was walking down the street with his prints one day, and Hoffman's father says, "What have you got there, son?" "I'm taking these down to Mergenthaler to have them look at them." "Well, let me take a look at them."

Futura ended up becoming a Bauer face instead of Mergenthaler by that chance meeting. The story was true, it was one of those interesting adventures that happens.

Hoffman was a real gentleman. He was excellent. I worked on the negotiations with Compugraphic, because Compugraphic had adapted Futura and didn't want to pay Bauer royalties.

Because I knew Hoffman, I called him at Bauer and said "Well, let's get this sorted out." I went down to Barcelona, we had some wine and just talked.

I finally said, "What about this Futura?" He said, "What do you want for it?" "Here is my best offer," I said, "$5,000 plus royalties?" He said, "Fine."

That was the best part of working with Europeans, you could tell them straight out. You could do business with them, but it wasn't the most important thing in life to do these things, unlike Americans. "He just cheated me out of a nickel—I'm going to hate him forever." You never ran into that mentality there. Dealing with Europeans was so refreshing. Of course you would have to hold up you end of the bargain, too.

What products did you work with at Compugraphic?

I was now in a complete marketing position, with no staff, no tools, just myself and my suitcase. I continued to live in Holland and I had an office in Paris.

When we came out with EditWriter series of machines, [See figure 8.5, PAGE A.37] one of the biggest problems that Compugraphic had was with the lowercase "t." You could always tell it was Compugraphic, because the lowercase "t" would either be higher above the baseline or below the baseline. It was because it was the first character on the filmstrip.

Compugraphic had problems with the clip positions. As you positioned the clip, you were dependent upon it always being in the same position—

but it never was. Finally, maybe five years after this, they changed the order. They got the lowercase "t" out the top position.

It was really a dumb thing to do in the first place. I think it was based on frequency data, but I don't understand why the "t" would be first and the "e" is way down at the bottom. It is almost as if it was based on the Monotype keyboard, which is t-o-a. Here the second character is "o," but the third is "h." But that was the biggest problem they had on the machine was the lowercase "t."

The people at Compugraphic really weren't much fun. Here was a typical form for a type survey in 1970. At every meeting they had about fifty people present—I never saw such a thing. They would actually give us a list of all the typefaces and who had it.

It was interesting that they actually took the time to spend the money on gathering this information. How long did it take to compile this report? Then they would move into sales. They would even have people going through publications to come up with what typefaces they found in magazines.

So would you base what typefaces you would create on that information?

That's right. That's what we would create and then market. Since I was in Europe for them, my input was the same, except I had to inform them on what was going on in Europe. I went out to the United States for three day meetings.

You worked with Cynthia Hollandsworth at Compugraphic?

Cynthia Hollandsworth is a good type designer. She came out with some very unique typefaces. Some of her faces are Schubert and Signac [See figure 8.6, PAGE A.38]. All of her designs were really great—face called Hiroshige, and a face called Tiepolo, which was adapted by ITC as an ITC typeface with all its iterations.

I also noticed in a new listing a face called Wile Roman. I suspect that this face was named after Don Wile, an executive of Compugraphic. He was very much involved in the Type Division, and was a confident of Carl Dantas, who was president in the days I was with the company.

High Technology Solutions [HTS], a religious group, was where Cynthia first started. HTS actually had their own typesetting system. Some of the languages they designed for, I have never heard of. [See figure 8.7, page A.39] In back of this was a religious group and what they were trying to do was create type styles in every language in the world so they could promote their religious beliefs.

I know she worked with them for years, but after that she went to Compugraphic. She later became the Director of Typefaces at Compugraphic and was in charge of their type designer group. She also started a group involved with typeface protection.

There was a very active community at Compugraphic and we would have meetings to try to protect typefaces.

Chapter 9: Itek Corporation

What do you remember about working for Itek?

My job at Itek was very interesting. I was really working for two companies, one of which was the old Photon, Inc. that I was involved in my earlier years. The company had been bought and sold many times, and all that was left was a few Photon second-generation models, and a digitized machine called the Mark VIIII.

The second company was as marketing manager for type products for a division of Itek in Rochester, New York. I was the only marketing person at Itek, New Hampshire, and reported to that staff, but had no authority to market anything. So in order to do a type promotion, I had to get approval from Rochester! Madness.

Compugraphic was cautious. They didn't want to get sued by anybody, so they would only use initials to designate their typefaces. I can't even remember the initials. I guess Times Roman was TR. Then they had a similar tool list that they put out so somebody would know that TR was Times Roman. I hated it. I said, "What are we afraid of, let's call them as we see them."

When I was at Itek in the 1980s, I went over for DRUPA. DRUPA is the biggest printing show in Germany. At the time Itek have very little in the way of new equipment to show, especially for the European market.

I don't know how I ever convinced the management, but we didn't have any new equipment coming out and they had contracted for space at DRUPA. I said, "Look, let's have a typographic exhibit." They said, "What are you talking about?" ITC had a typographic exhibit that travelled around the world a year earlier. They had a competition where designers had sent in artwork. I told them we should put ITC's typographic exhibit up in our space.

I talked to Aaron Burns, who was a great friend of mine at ITC, who knew all the right people to contact. He said, "I have no problem with it if you can pull it off."

We actually mounted that exhibition. I called for the pieces to be delivered to Dusseldorf. They arrived from America two days before DRUPA. The exhibit was on display for the whole fifteen days of the convention. We even had a ficticious contest where Hermann Zapf awarded the winner. It was arranged so that the Itek dealership could generate business from the winners. I still have pictures of Zapf congratulating them. [See figure 9.1, page A.40]

The money to finance the exhibit was pretty severe. The message I received from the experience, not from Itek of course, but from the people in that part of the world, was that it was fantastic. Here in the middle of all this modern machinery, was an art exhibit.

Many people who lived in Europe had submitted pieces. Some of them lived in back of the Iron Curtain and they were not able to come to the United States to view the exhibit, but they were able to go to Germany to see the printing show. They were really appreciative of having the chance to see the work of their local artists. These days it probably would be difficult to pull off something of that magnitude, but it was a fantastic adventure.

You know something like that was not done at that kind of show, especially an American company. Americans aren't going to put up artwork. They wanted to cram everything, put a machine in every 16 inches, show every model, every kind, every type, so people will be impressed. It didn't impress anybody. Americans don't understand that.

What project did you work on after that?

After DRUPA ended, I had been away from home for almost three weeks and my wife was going crazy. Unitex, the other newspaper division of Itek called and said, "Wheatley, there is a problem. You've got to go to Czechoslovakia."

They had sold two of the big typesetting systems. One had been sold to the Army and the other to the Communist party. These Czech-Slovac newspapers weren't working. Czech-Slovac involves two distinct languages that have different accents and the machines just had too many accents.

I told them that I would take the job. I went to Austria for a visa to get into Czechoslovakia. On Saturday afternoon, I actually was at the back door of the Czechoslovakia embassy. The agent took my passport and gave me a visa, so I would be able to get into Czechoslovakia. It was unbelievable.

Well it ended up that I didn't need to do anything! I went over there and held their hand, it was so logical. Because of all the studies I had done, I knew all that needed to be changed was the fonts. The problem was just that there were too many of them and the machines couldn't handle it. They had to make some of the characters solid and some other characters floating. We just changed some of the character sets. It was a software problem, not a type problem.

Here I went into the Czechoslovakia Army headquarters—an American going into the enemies head offices. I was with Austrians and some people from Czechoslovakia. I had a fantastic time and all because I was there to solve a type problem.

I have also been inside the headquarters of the Egyptian Army when I was with Varityper. It was the same kind of situation. They took me inside and I was looking at interesting top secret information. It was amazing that with an American passport you were able to go anywhere.

What other products did you have at Itek?

The Mark VIII was the only digitized face machine that Itek ever made. We had to work with engineering to get the measurements—the baseline, the cap line, and how far we could come down with descenders. Engineers effected all of this, because if they would mess around with the lenses or change something else, then they would force the designer into changing the design parameters. The only other way to get around that would be to push the characters off the baseline and push them up, but then there would be problems with the accents.

We put the Pacesetter out of business in 1983 and we made a brochure to sell the glass disks. [See figure 9.2, PAGE A.41] It was to be the last sale, because once we had sold all the disks, then we were not going to manufacture any more. We were going to dismantle the camera. We found out that many people were still using the machines, and they were going to be stuck because they wouldn't be able to buy anymore typefaces.

I was designated to end the production of all Photon second-generation glass discs. Although we still had the camera to shoot originals, most of what we did was create copies of existing discs from the masters.

I created a type promotion and travelled the world ending that business. My travels included Beruit, Lebanon, as well as Germany, France, and the Scandinavian countries.

We were working on contracting the Japanese language in the closing days of Itek. I knew I was over my head, I don't understand Japanese or Chinese. There are just too many characters. How do you define a character set? Today, you can take the 5,000 character set, identify them, and then figure out whatever the customer wants. Back in those days you actually had to lock the set into a piece of film.

You worked with Peter Purdy at Itek?

A Swiss company, Bobst Graphic Systems, tried to develop a new typesetter, which was the brain child of Louie Moyroud, an older, but still inventive man still working on typesetting machines. Peter Purdy and I went to a meeting in Switzerland to see how we could put the Itek machine together with their machine.

It was just one of those ill-conceived things that was never going to be. It was another case of management sitting up in their ivory tower saying, "Wouldn't that be a great idea if we could just take their technology and our marketing ability and take this thing and put it together? Let's send Wheatley and Purdy over there to come up with how we are going to do this."

We both knew when we were talking that the whole thing wasn't meant to be, but the problem was how were we going to go back and tell our managers something that they thought was so great, wasn't going to be great at all. I remember talking to these people, looking at this machine and we were just shaking our heads, "Why are we trying to do this?"

Anytime we got in bed with somebody else's machine, we had a problem with compatibility of output. We had designed all these alphabets in a certain way and if the venture didn't work, we would have to do it again, but how many times are you going to design Times Roman?

I'll tell you a story about Peter Purdy. Peter Purdy developed a cathode ray tube [CRT] typesetter. It was Purdy-McIntosh, [See figure 9.3, PAGE A.41] an English company that built the cathode ray typesetter for Mergenthaler. Peter Purdy was a crazy man, but he actually proved to the world that you could put a CRT in a milk bottle. He proved that it could made that small.

Peter sold the CRT rights to Mergenthaler and then he developed a way to address digital fonts with a technique he called PM Digital Spiral. The

principle was by using a spiral, you could find any part of a character someplace on the spiral-round, straight, etc. [See figure 9.4, page A.42]

In fact, Addressograph-Multigraph used the spiral technology to digitize all of their fonts. Varityper put out a brochure, which showed the way that the spiral worked. It had a lot of information about the typefaces and showed the Spiral methodology.

You would scan the letters in and then you would plot the positions against the spiral. These positions would have number coordinates and then the coordinates were stored to digitize an alphabet.

Peter finally ended up going to work with at Mergenthaler with Bob Smith when Mergenthaler took over Itek. I used to go into Peter's office to ask him how his day was. Four hours later I would be coming out of there. Of course being gone that long there would be phone messages, people looking for me and I was with Peter.

Ever since that time that we worked together, Peter would call me out of the blue. He'd call me and say, "Hey, Bill, can you give me the phone number of somebody, I'm calling you from London," or Germany or New Hampshire, "I need somebody's phone number, can you call me right back?" Or he would call me with these other weird things. The last time he called me to tell me, "I'm now the president of Monotype." I said, "That's nice Peter."

Peter's wife was an American living in England. He left his wife in their beautiful house on the Thames River and went off to America. English people seem to do this. They love it.

While Peter was in America, his house was taken over by gypsies. I met his next door neighbor and they said the whole house was just crawling with people. It was crazy. His wife had moved to an apartment, Peter was in America, and his house was being taken over by gypsies.

Peter didn't care. It didn't mean anything to him. He told me he made his first million when he was twenty-one and he lost it by the time he was twenty-five. He made his second million when he was thirty-five. That was the way he lived. He either lived like he had everything or he had nothing. It didn't make any difference to him.

I remember Peter had a little office in Nashua, New Hampshire. He had a bed and lived in the back of the office. He was a man that two months before would of had a suite in Buckingham Palace.

I have never met people who are so carefree, but are so brilliant when it comes to a project.

Bitstream was started during your days at Itek?

Bitstream was started by Mike Parker and Matthew Carter, who actually came from Mergenthaler. There was always this funny feeling of how could you have been so tied to one company and then all of a sudden start a new company making typefaces. The whole library was the same one at Mergenthaler. It was probably blown out of proportion. I think this change was really the first attempt by anybody to actually create a company where you only sold alphabets.

Well, ITC was doing it for years, but on a different basis. Because ITC was really creating the alphabets and then marketing them by putting out the upper and lowercase and the additional characters. They were selling it to many people who were sharing the same alphabets. Now here was Bitstream actually doing business to provide alphabets to everybody.

I used to spend some time with Bitstream in the early days when Mike was around. They've gone so far from that now. I think the Bitstream library has become pretty broad. There are not that many alphabets out in the street. If you are going to start a company, you need to have alpha-

bets. You don't want to start with lettercards, photographing characters and then digitizing everything. That's a big project.

Mike Parker came up with his own classification of typefaces. For example, Old Style, Traditional, Slab Serifs, Free Forms. Bitstream tried to reinvent something, but because of the way they classified the typefaces. it was difficult to find anything.

Are there any designers you remember from Itek?

John Schappler is an old type designer. He actually is a calligrapher as well as a designer. He designed the text faces that they still use today in the *Wall Street Journal.* He designed many of the typefaces at Itek.

John goes back to Hunter Robert Middleton, Director of Type Design at Ludlow Typograph Co. John did a lot of work at Ludlow, a typesetting machine company in Chicago. The Chicago studio was right on the tramway. Right where the tram and the L make that big loop. He said every time the train went by there, it shook the office. In the middle of a design, the designers had to lift their pen from the paper and wait until the train went by. What a distraction.

John also did a whole bunch of script faces at Itek for the Quadritek [See figure 9.5, PAGE A.43] and one of the script faces was named after his daughter, Rita, so it was RitaScript. [See figure 9.6, PAGE A.43] His daughter actually did some font work with me when I was consulting. She was in software development since her father was a font designer. She worked with Digital Equipment Corporation [DEC] for awhile and now she's at whatever is left of Wang.

Beruit Arabic Artwork

In the closing days of Unitex, Samir Sadar and Mikhel el-Hachem, two business partners who were dealers for Photon equipment in Beruit came

over to the United States from where they were hiding in Lebanon. They had created artwork for Arabic typefaces, so Photon could make the discs for the Photon machine. This allowed them to have a machine to sell in their Arabic market.

Unitex had this artwork in Wilmington. At that time Bob Smith, who was the president of Mergenthaler, was now the president of Unitex. The company thought that they wanted to keep this artwork and we could do something with it.

I told the partners, "Why don't you come by at five o'clock tonight." I had somebody put together all their artwork and when they came by that night I gave it to them. About a month later somebody wanted to know where the artwork disappeared.

To this day no one knows that I gave it back to them. There was no point in trying to hang on to it or to do anything with it. It was theirs and there was no point in us keeping it. That was the kind of thing you had to do in those days.

Chapter 10: Consulting

What did you decide to do after working with Itek?

When I came back from Europe after my last real job with Itek in 1986, I became a consultant and I did a consulting project for Scitex. What they wanted me to do was make a survey of the future for newspaper advertising, what trends were going to happen. I think I spent six months travelling around the country. I wrote a report, which I guess I did believe in it, but it was hard to determine.

I also did some work for DEC. We did a couple of typeface jobs for Tokyo Electric. The machines that they developed for DEC were 300 dpi printers. I still have an old Corona program that we used to bring up and edit 300 dpi bitmapped fonts on the screen.

One year Hewlett Packard [HP] came out with a tax program where you could emulate the US tax forms on a HP Laserjet. DEC could do it better. The advantage of a DEC system over a HP was that DEC had such a large system, you could do a hundred accounting clients on a DEC system and just print them out. Whereas if you were using a little PC, you didn't have enough memory to keep a hundred clients in storage.

I, in conjunction with a company called Lincoln, Inc.,who had actually done the controller for the LN03 laser printer, developed the HP tax cartridge to run on the DEC LN03 laser printer. The printer had two slots for cartridges, and this enabled the printer to format the documents in a HP format. I actually used Purdy's offices in Nashua, New Hampshire to burn the ROM's which went into these cartridges. In one year, I must of made 250 to 300 cartridges, because DEC never went and pursued that market.

When HP finally came out, it was the only printer that needed the cartridge, because there was no memory storage in the machine. As HP machines became more advanced, they put memory in the machine. You

were able to actually download soft fonts and the cartridge wasn't needed anymore. It was just another type application business that was available for one year, you marketed it, and then it went away.

We fully emulated the 1040 tax form. It had ten different type styles in it. The body of the form was always the same but since you had to do the whole form, you had to have a font for each size. They were bitmaps, so you could not size them. You had to have a 10-point, an 8-point, so on. It took us a while to actually do the development. It was an interesting project.

What do your remember about working with Robert Norton?

Robert Norton came over to the United States. He's been at Microsoft and recently went back to England. Robert is the one who put together *Types Best Remembered, Types Best Forgotten,* the book that I wrote the article about John Matt.

In 1986 we founded a company called Digital Type Systems Ltd. We had three partners, Robert Norton in England, Ernest Imhof in Switzerland, and myself in the United States. We worked together for two years.

We did a math set for a mathematical company in New Jersey. It was based on Times, but it was made out of math characters. There were about 500 characters to adapt to make a whole set of mathematical symbols and characters to work on mathematical formulas. It was an interesting project.

We had a couple other company contracts. I actually did a contract for Tegra. Tegra was the last vestige of Varityper. It bought Varityper divison out and then it went out of business, but they still have machines around that are sold.

Dana Dahl was the last designer for Tegra. She used to do a lot of special typefaces. She used to call me to ask me questions, "Someone wants this typeface, where do I find it?" or "Who has it?"

The trouble with the company was that nothing was ever finished. I was in America pursuing sales and I remember that I'd get a sale and sell some fonts to Digital or to Compugraphic. I would say, "We need this character set." We just didn't have the character set. It was really frustrating.

Ed Rondthaler started a company in this country called Photo-Lettering Inc. that used the old Rutherford Photo-Letter Composing Machine. This was the basis for the type library we used.

In the early days, they were doing headlines with the Rutherford machine. If you wanted to add a word, you would call them up and say, "I want a word." They would do the word in type and then put it out on 35mm film.

They had thousands of typefaces. Well, they weren't actual typefaces—they were not complete alphabets. They were just words. Later, they started making complete alphabets.

We decided to take some of these headline typefaces and put them out for use on laser printers. N. Worth invented the Lilith, which actually was a graduate project for the Swiss Federal Institute of Technology of Zurich, to develop a typesetting system.

There was another graduate from the same school, Eliyezer Kohen, a Turkish Jew who is now with Microsoft. He developed the software to go on the Lilith. It was called Modula-2. He put the machines together in Robert's system and that's what we were using for the converting the artwork to 300dpi.

Eliyezer Kohen's master's dissertation was about middle resolution font design. It was the software he developed that ran on the Lilith. I have never read it, but it was really quite a system for converting fonts. He sent me a copy of it, so I just kept it as something from him.

Eliyezer Kohen had funny adventures because of two reasons. First, because he was Jewish, as soon as he graduated from school, the Swiss said, "Out." The second thing, he was Turkish and every Turkish man was required to go into the military.

Eliyezer Kohen is a man who is 5 foot 4 inches and weighs about 88 pounds—a real tiny, scrawny guy. Of course he had put the military service off as long as possible. He had deferments because he was in school, but he still had to serve that time in the military.

At that time I was working with a company in California, Jump Ahead Software. The company bargained down the military requirements with the Turkish officials to about two months, Monday through Friday.

The company booked him a motel room near the base, so Friday afternoon, Eliyezer could come back to the hotel and work on computer typesetting. On Monday morning he would go back and play soldier until he got out of the army.

Eliyezer has many doctor degrees and in Germany, it is proper to be addressed by as many doctors as have acquired. For example, if you had six doctors, you would be called Dr. Dr. Dr. Dr. Dr. Dr. His wife was a German brain surgeon, but neither one of them could get green cards to come into this country. She went to Canada and we were trying to a green card for him, but we were unsuccessful. Somehow he ended up with Microsoft. I've talked to him three or four times since he has been there, and I'm sure he's up there with the geniuses.

I sold some of my books on the early rules of typography to Microsoft, because they didn't have any. How can you develop software to manipulate type, if you don't know how type is supposed to be manipulated? They didn't know.

But now, if you look at any of these software programs, it's a wonder some of the things they do. Apparently, Microsoft must have taken the time to look at the basics.

How did the royalty process work?

Also with Tegra, we did some of scripts that came out of Norton's digital type system, which I was getting royalties. When Tegra went bankrupt then I didn't get any more royalties. The whole thing just stopped.

The royalty they paid was so little—$1.50 every time we sold a font. It probably costs a thousand dollars to develop the font and give it to them. They pay the designer $500 and the rest of the money would be made back on the royalties, but it doesn't even out. The designer probably collects all of $10.

It's a problem with the world of type, if you design something, there is no way that you can recoup your money through royalties. You have to get your money up front. You have to sell it the first time, otherwise you're washed up.

That is what I guess happened to ITC. They're now in the digital type business, from what I understand. They offer typefaces of their own, just like Bitstream. You buy the data directly from them. You don't buy the artwork and then make a typeface anymore. They give you the digital data.

You can buy their whole library. You call up, give them your credit card number, and then they will unlock a font. The fonts are all physically there. Can't people break that? I would think that like everything else, people spend more time figuring out how to get around something than going out and legitimately purchasing it. Can you get new faces?

They send you an update disk every year or two.

I know some of those are pretty inexpensive.

I think about $50–$200 for the family.

Have you done any recent consulting work?

I recently became involved in a new case where Scott Rogers from New York was the referee. I had to go out to Chicago to a company that had water damaged two-inch filmstrips. The company claimed they were worth $200,000 and hired me to go out to look at them. I looked at all the filmstrips and said they were worth $1,000. Well, they didn't like my answer so they went to a referee.

The filmstrips were down in the basement in cardboard boxes. It was such a mess that you couldn't find them in the box if you tried. They had probably been there for ten years. All of a sudden, the sprinkler system goes off and the boxes are damaged. Now the company has a gold mine.

They said that a lot of those typefaces were irreplaceable, and they couldn't get the artwork. I said "Look, go get me a specimen sheet, I'll photograph it and ten minutes later we'll have a font for you, but what are you going to do with it?" They had fonts for Marlboro cigarettes that were used ten years before and the logo has been changed since then.

Type design and type today is a dead business. What will replace it? What has replaced it? I received catalogs from Image Club, a company in Canada as part of this lawsuit.

I was looking to find the typeface replacements for the water damaged films. They said the typefaces just couldn't be replaced, but I found at least fifteen of those typefaces available in the book. They said it would cost $2,500 to re-render the alphabet. I said if they bought them from Image Club, they would be $20.

The argument became so ridiculous. At a meeting in New York the company representative said, "They are not the same." I said, "What do you mean, they're not the same?" "Well, it is a different cut." I said, "What are you saying to me?" He said, "Well, it is the same with ITC."

ITC provided the artwork for all the manufactures. The artwork was a lettercard in a certain size and then a manufacturer would take it, render it, and place it into their machine. The representative said to me, "Well, even ITC faces are different. Depending on what manufacturer did it." I said, "That is ridiculous, maybe they are different because of the mechanical limitations but basically, if you ran out twenty different manufacturers making the same face, I defy you to tell the difference, or which manufacturer rendered it." All the design characteristics were the same.

What do you remember about the early days of Adobe?

ATypI is the organization in Europe that meets once a year in different countries and fights to protect typefaces. The reason I laugh at that is because the same people who were stealing each others typefaces right and left, would meet at these meetings, and say, "How are you," "I love you," and da-da-da. Everybody knew everybody was stealing the other person's typefaces.

It almost became a club. Okay, we're in the club and we're all stealing each other's typefaces and that's okay, but we don't want somebody outside stealing because that isn't okay.

ATypI had a meeting at Stanford University in California in the 1980s. Charles Bigelow was teaching at Stanford at that time. He had been awarded the MacArthur Foundation Award when he was at the Rhode Island School of Design. Meeting at Stanford was really fantastic because they had a lot of activity in typography.

Stanford had a lot of type machines and laboratories. They had a system out there called Metafont and it had many experimental ways to express a letter. At the same time somebody heard about a little start up company down the road that had just obtained their first venture capital.

A whole group of us, Robert Norton and I, and a few others, went down to visit this new company. In one of the strip malls, they had a little tiny office. That was Adobe. There was John Warnock, who had just left Xerox Palo Alto Research Corporation, which was really crazy because Xerox Parc had it all. Xerox had everything.

At the time, Xerox Parc was working on developing programs for every language in the world. That was their goal. John Warnock and Charles Geschke left the Parc and Adobe was their start up company. [See figure 10.1, page A.44]

We had interesting theories about how they were going to come out with an outline to describe typefaces. We all said, "Yeah, sure." Well, we know what happened to that and where they are now. I know Warnock and Geschke are millionaires because of that little company.

Actually, I think Geschke was kidnapped a few years ago. It was the most bizarre thing. He was kidnapped and held for ransom. To know Geschke, I'm sure he enjoyed it. He's really a cool guy and he never really gets upset about anything. He probably said, "Ok, they're not going to pay it, so what are you going to do?" It was just bizarre. I guess they figured that he was a millionaire.

Liz Bond worked with them at Adobe later on. She was really their first marketing person. Liz used to be at all our ATypI meetings and she was at that Palo Alto meeting. I have lost track of what has happened to her.

A lot of people really got into the business because of their love for type.

Liz has always been somewhere in the type world. She was at Mergenthaler, then she was at Xerox, but always in type. It was always the same group of people around.

How do you think the business has changed with the advent of the computer?

One thing that has happening to the industry since the Macintosh is that little flyer will be made with twenty typefaces. That's what will be done, thinking more is better. Typesetting for Dummies—that's probably what we need to publish.

There was a paper company called Tileston and Hollingsworth, which used to have a calendar competition. Twelve printers would design calendar pages. T&H would have famous speakers go to the printer's meetings to promote the calendar and its design. The designers could do anything they wanted within limits and it was printed on Tileston and Hollingsworth's paper. It was probably the most popular event that the printers would go to for years.

I know that Al Lawson had judged some of the contests. He would travel to a couple clubs and give his critique. Of course, everyone has his/her own opinion. I'm sure Lawson's view of a good calendar page would vary from somebody else's view. The fact that they would spend the time and money to sponsor that contest was amazing. All for somebody to win a little certificate that they won the "T&H Calendar Award for 1953" to put on their wall.

It could be printed by offset or by letterpress—you could print it any way you wanted. It was the printing thing to do. We don't have competitions like that anymore. I don't see anyone running off to do a Macintosh contest.

I have a friend who owns a computer shop here. I start talking to him

about typefaces. "Does anybody here know how to do anything with them?" Nobody knows how to access them.

I used to have trouble with people understanding point size. The given point size of a letter once you take away a piece of metal—you lose that dimension. When you say it's ten points, they say, "Well then why doesn't the letter measure ten points?" You'd have to go back to what we called the imaginary body.

In hot-metal typesetting, when you put two letters together on two different lines, you've actually built in the spacing. so you have letters that don't bump into each other. Depending on what the character was, whether it had long ascenders and descenders, the lines just wouldn't bump into each other. No matter what. But now with the computer, you can set a 10-point character on 8-point leading.

Are there any other good designers you worked with or were familiar with?

Oh, there were a lot of good designers. For example, Whedon Davis, the designer that came into Varityper Corporation when Bently retired. He had worked for ATF and his claim to fame was his one face, Whedon Gothic Outline. [See figure 10.2, PAGE A.44]

In those days there weren't a lot of new name designers around. That was another problem with Varityper, we never had a name designer. Bently was not a designer per se. He could design, but he never designed on staff. He was not a name.

I like European designers like Adrian Frutiger. Within the last ten years, he redesigned his own typeface, Univers. It was a fantastic project, to design a series of typefaces with a plan using numbers and using mathematical progression both ways. He was a genius.

The Haas typefoundry came out with a san serif face called Unica, which

was really a rip-off of Univers. It was the same idea of typeface development, creating a whole family. They made Unica for the Scangraphic or the Docuporter. I don't think the Haas foundry is pretty much today.

Another type designer who really did a lot was Adrian Williams. He started a company called Fonts in 1974. The square face that I used for the Dutch movie subtitles in Europe was Rockwell. It was known to be done by Adrian, but he never got credit for it. For years there was a big dispute whether he had done the design or not, but he actually came up with the original designs.

Adrian created another typeface in the same category called Raleigh. [See figure 10.3, PAGE A.44] For years it was used by Peugeot for their corporate image face.

Like Zapf, Adrian does all the work and develops really good typefaces, then it either goes away or he never gets any recognition. Everybody and their brother has it and they call it Rawly. They say, "You never made that." It is one of the unfortunate things that happened over the years as people didn't care where they got their typefaces from.

Are there any designers you worked with that you are still in contact with today?

John Schappler from Itek and Dana Dahl are the only people I'm still in touch with. I don't see any of my Dutch designers. All of them have dispersed and none of them design type anymore. One is at Siemens, one went crazy, and one gave up the design and went to Greece and now takes tourist photographs.

All these people graduated from schools in Holland that actually taught type design. I don't know what you can do with the profession now, if you are a type designer trying to make a living.

Could a designer work for a big company?

There are not that many big companies anymore. I suppose Adobe. Robert Slimbach, worked for Adobe and he has come out with a couple typefaces. Other than that there is not many name people. In fact I don't think Zapf has made many new faces. I haven't seen any because I am too much out of the loop.

Chapter 11: Summary and Conclusions

As I sit here and think about it, my experience in this whole thing has been so vast. We got into the early days of paper and chemistry, because of the stem widths of characters. We found a phototypesetting paper that the only way we could work with it was to keep it in the refrigerator. Not only did we need to have a phototypesetting machine,—we needed a refrigerator.

Then we had problems in Europe, with typesetting machines that had to be grounded. They were all running on 220-volt in Europe, so the voltage is higher. Hence we couldn't put a machine in Athens for a long time because Athens didn't ground anything. If you put a machine in, the next thing you knew, it was doing things all by itself.

Then you get into character sets and then characters. Characters people think to put in an alphabet when they don't even know what characters are part of their alphabet. Hyphenation and all these other attributes . . .

All you started off doing was designing Times Roman. Now you find yourself off on these diverse projects, which are all part of the same program. But at the center of them, all you are trying to do is to prepare to set a line of type and justify it.

I mean it is truly amazing when you think of all the other aspects that go with the whole industry. You are taking an idea, a rough is drawn, it is rendered, then the type is set.

We touched on photoengravers. Photoengravers did everything in inches and printers did everything in picas. Picas and inches don't convert to each other. So we would get all these wonderful cuts, put them in forms and they wouldn't fit. It was so stupid. You think that somebody had to convert. Since the photoengravers were the last in, why couldn't they? But they never did.

There was the problem between Europe and America, the Didot points and the American point system. If you were designing a typeface, which was based on European tradition, it was based on a Didot point size. 10-point Didot is not 10-point American. If you say it is a 10-point face and you start making it that face size, you are probably making a face that is more 12-point. You were starting off with the wrong design size.

Sometimes when you bought the fonts of type, you had to change the ratios of the face or bring it down to American size, if that is what you were trying to do. We did actually make some European machine versions with the Didot system. The characters that were more useful to them. I never did get involved with that project, but we actually had Didot machines. A very complex world.

That's before all the simple days. Hot-metal didn't have those problems. The hot-metal was more or less working with one system. Monotype, even though it was matrices, you would still have to go and change characters. You had character choices.

As I think back on it now, the best time I had was with the Itek exhibit. I still as I sit here now, I wonder how the management allowed me to do it. It's just impossible to imagine now. We did not show one machine—it was just typography exhibits. Can you imagine that in today's world? I must have been pretty convincing in those days.

What resources are available about this topic that you would recommend?

The book, *A Concise Chronology of Typesetting Developments* 1886–1986, was written by Lawrence W. Wallis. I have the original manuscript. The advantage of this chronological guide is it actually takes all the typographical improvements by year. We can take 1967 and it will tell you the different companies that had notable changes in that year. For example in 1967, Addressograph-Multigraph introduced the AM 725 under license from Photon. It's a great book because I don't think anyone can remember the dates.

Wallis was a fantastic writer. He wrote a book on phototypesetting machines. It gives you all the machines and their classifications and lists the AM 744–48, they came after the AM 747. I don't know why we had the AM 744 after the AM 747, but this guide gives all the specs.

In 1984 Wallis did a study in composition. He used to write for *Typeworld*, which was Frank Romano's old publication. This picture of Wallis came out of *Lithoprinter Week*. [See figure 11.1, PAGE A.46] He's retired now from Varityper. The last time I talked to him, he had just come back from a lecture in India.

This whole book, *Book of Information*, is nothing more than how to do type. This one is all worn out because I carried it in my briefcase. Here in typographical dimensions, we have point sizes, units, wordspacing—it is all Monotype oriented. But then we have the parts of the letter, weights of letters, and widths of letters. Then it went into the classification of typefaces and the recognition of typefaces. You can see this page was worn from use—the accents that were used in different languages.

I used this book probably every day of my life when I was dealing with character sets. The book was absolutely invaluable. I probably had twenty of these and then I would go someplace and I would be arguing about accents or something and they would say, "That's a great book, can I have it?" So I would give it to them and I would call Monotype and say, "I need five more books." So they would send them to me. This was put out in 1970, but it's great information. I managed to keep this one, only because it's so worn.

If Macintosh had put out something like this, not this whole thing, but part of it, wouldn't that be a useful? So why don't you write that—you could have it out by Christmas.

Next year maybe.

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Appendix A: Figures

Appendix A: Figures

All of the following images and information has been supplied by Mr. Wheatley from his files collected during his career. As to most of the information being loose material or brochures printed without much more reference than the product name, there is limited bibliographical information

The majority of these images can be found in the William Wheatley Collection at the Cary Graphic Arts Collection. A select few are personal items retained by Mr. Wheatley.

Figure 2.1
Linotype
Machine

From a Linotype
Employee Brochure

[PAGE 2.1]

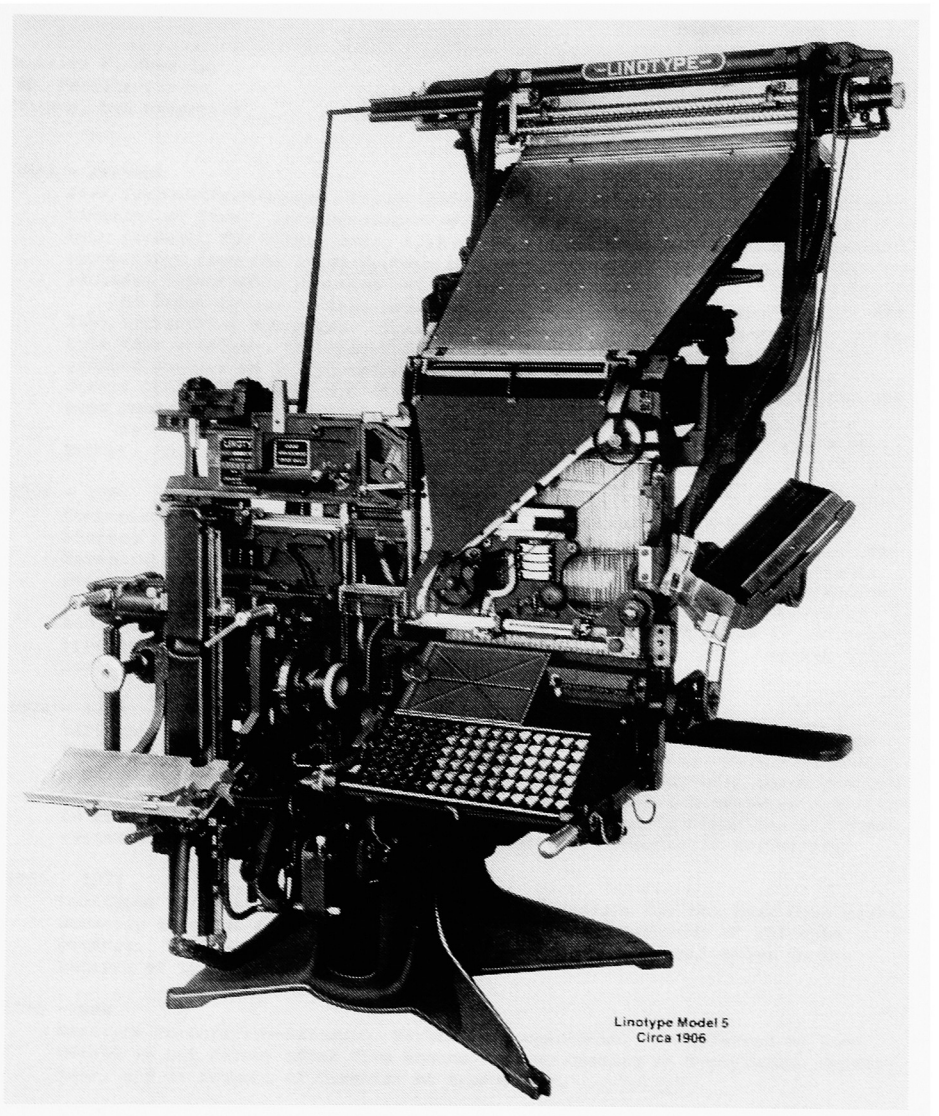


Figure 6.1
Résumé of
William
Wheatley
(Front)

[PAGE 6.1]

February,1984

William F. Wheatley
38 Profile Circle
Nashua, New Hampshire

Married 2 children
Age: 50, 6ft. 190lbs.
Health: Excellent

1981 - present
Itek Corporation-Manager, Typographic Marketing for the Composition Systems Division of Itek. This encomasses all marketing responsibilities for all type product, for direct entry systems (Quadritek) as well as digital phototypesetters from the Large Systems Division, on a world wide basis. Also includes typographic planning for recently released Digitek LED typesetter.

As first person in this position, have created a type atmosphere for all Itek typesetting equipment. This includes major direct mail type promotions, type face catalogs, training information, as well as advising on all typographic matters on all phototypesetting equipment. Continue to support a direct selling channel, U.S. based dealers, and European distributors for all type products.

January 1981, returned to USA after living and working for 9 years in Europe. (The Netherlands)

1978 - 1980
Compugraphic Corporation-International Product Manager, Type Division. Started newly created position agressively marketing type products in Europe. Established target quotas for dealers, completed first year 101% of target. Over 6 million dollars. During 1979 major activities were threefold: coordination of new manufacturing facility in Ireland; development of character sets and layouts for a new digital typesetter; development plans to increase type revenues by 25% by 1980. All plans on target by mid 1980. Worked from home, travelled extensively troughout Europe.

1972 - 1978
Varityper Corporation-Manager, Typography International, assigned to Europe for establishing a European type design center with five European type designers. Took over responsibilities for all software in 1974, with three programmers. Had full responsiblity for all type and software and assisted marketing in product development, special applications and specifications for all typesetters. Had full autonomy for all International Typographic activities.

1965 - 1972
Varityper Corporation-Assitant Director of Typography for the last four years, directly involved in the planning, development and marketing of all type product. Technical consultant to domestic and international sales in all matters of typography and software.

1965 -1966
Varitype Corporation-Salesman, Hartford, Connecticut. Transferred to Home Office in New Jersey after five months, due to opening in Typographic department, and at request of Director of Typography.

Figure 6.1
Résumé of
William
Wheatley
(Back)

[PAGE 6.1]

1962 - 1965
West Hartford Publishing Corporation-General Manager, Gazette News Press, and Production Manager, West Hartford News. Was hired to convert newspapers from "hot" to "cold". Also moved commercial printing plant from East Hartford to consolidate all operations. In 1963, West Hartford News was awarded "General Excellence" certificate from Weekly Press Association of New England.

1957 - 1962
Travelers Insurance Company, Hartford, Connecticut-Printing Coordinator. This position involved coordination of printing activities of departments within the company. For the first two years, was Scheduler-Expeditor. This involved the scheduling of all printing, and maintaining total production loading of all phases of the printing operation.

1956 -1957
Trade Composition Compnay, Springfield, Massachusetts-Salesman. Included selling and servicing clients in the greater Springfield, and Hartford, Connecticut areas.

1953 - 1956
Rochester Institute of Technology, Rochester, New York-Student. Graduated with Associate in Applied Science degree in Printing.
Graduated from Technical High School, Springfield, Massachusetts, class of 1951.

Associations
Typophiles, U.S.A.; Wynken de Worde Society, London; Association Typographic International (Atypi)

References
Will be furnished upon request.

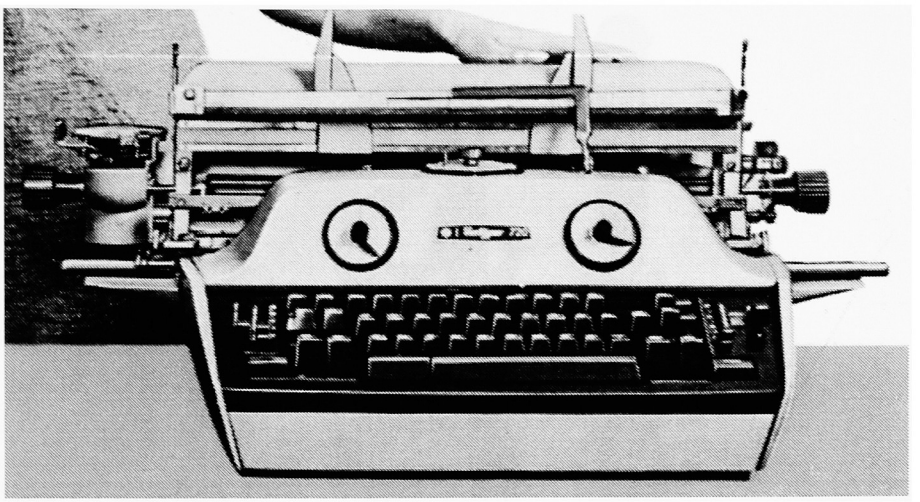


Figure 6.2
Varityper 720

From brochure
Varityper 720. The Office Composing Machine

[page 6.1]

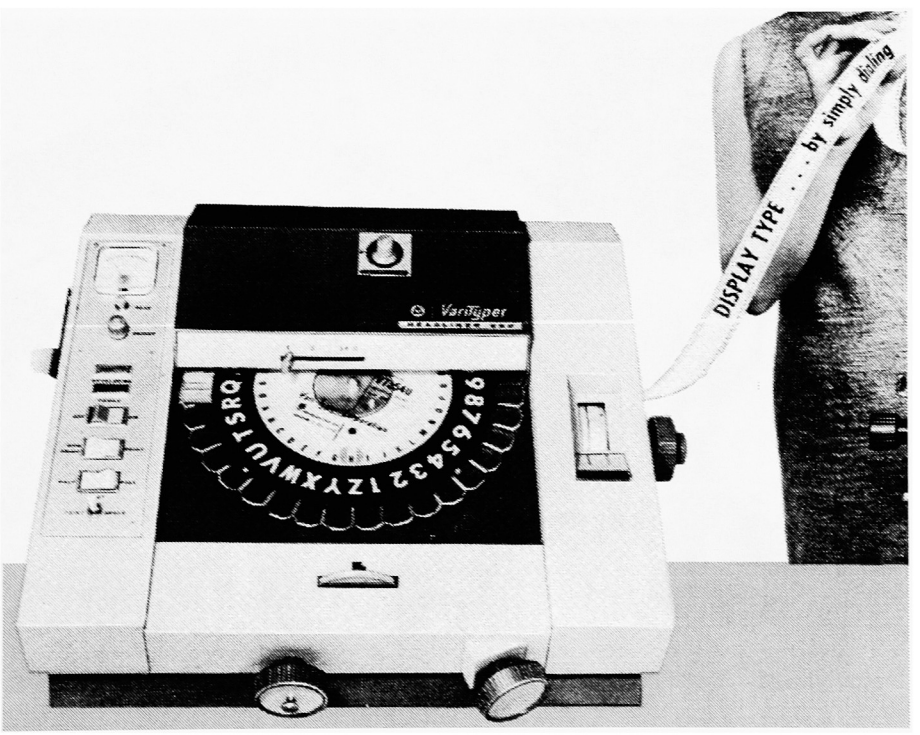


Figure 6.3
Headliner 880

From brochure
Varityper 720: The Office Composing Machine

[page 6.1]

Figure 6.4
Example of Varityper machine's differential letter spacing

From brochure *Varityper 720: The Office Composing Machine*

[PAGE 6.4]

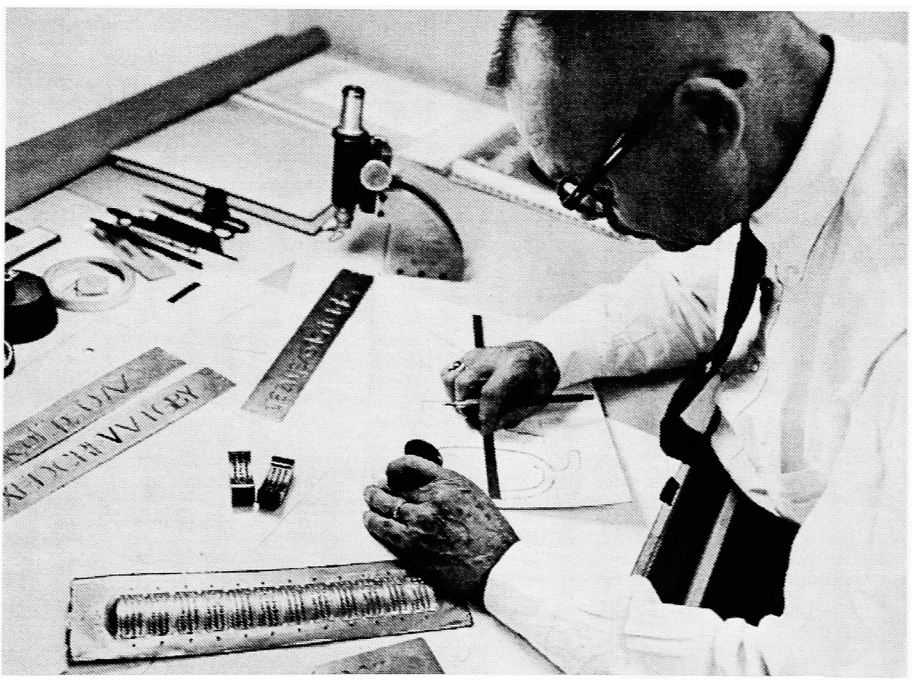


Figure 6.5
Bently Raak designing type for the Varityper

From brochure *Varityper 720: The Office Composing Machine*

[PAGE 6.4]

Figure 6.6
Commercial model of the 1881 Hammond typewriter

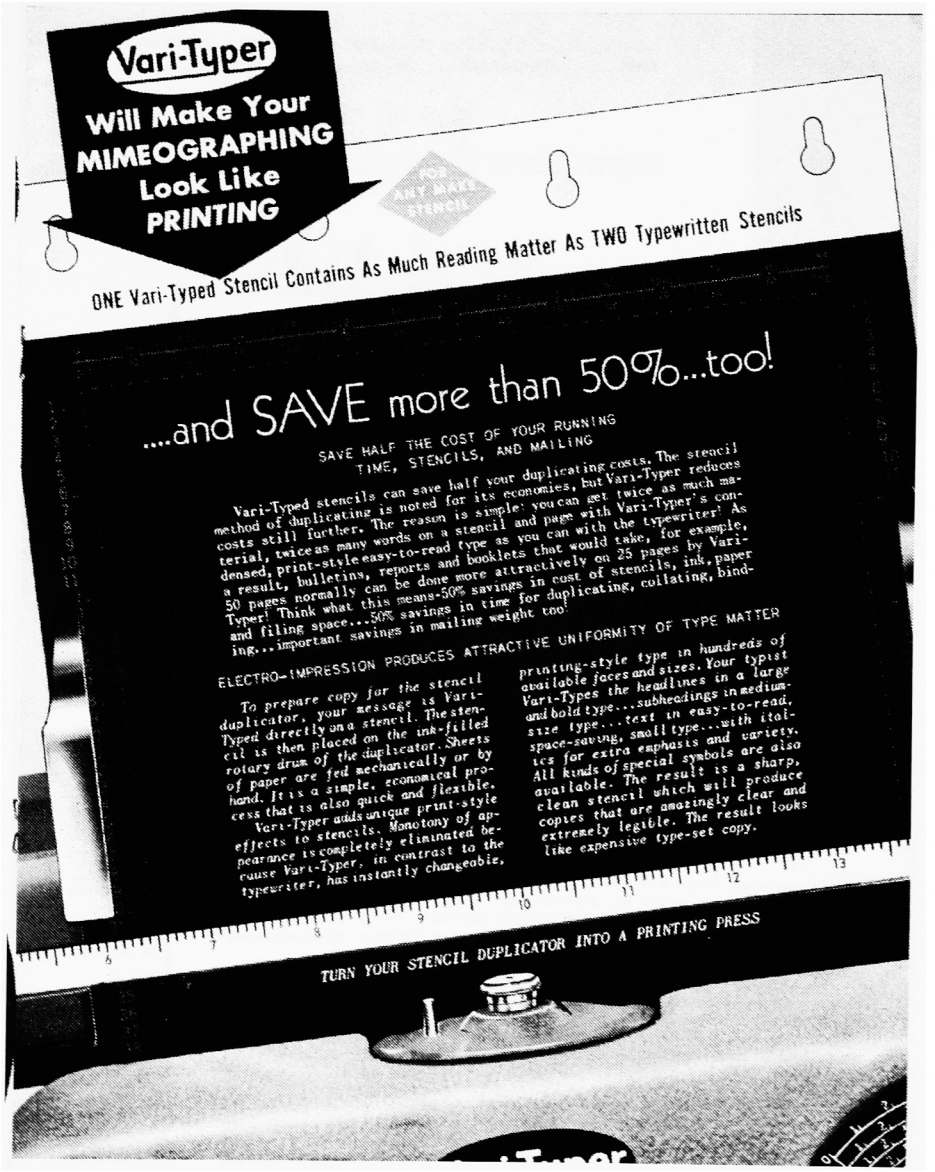
From Varityper brochure
. . . the story behind President Wilson's typewriter

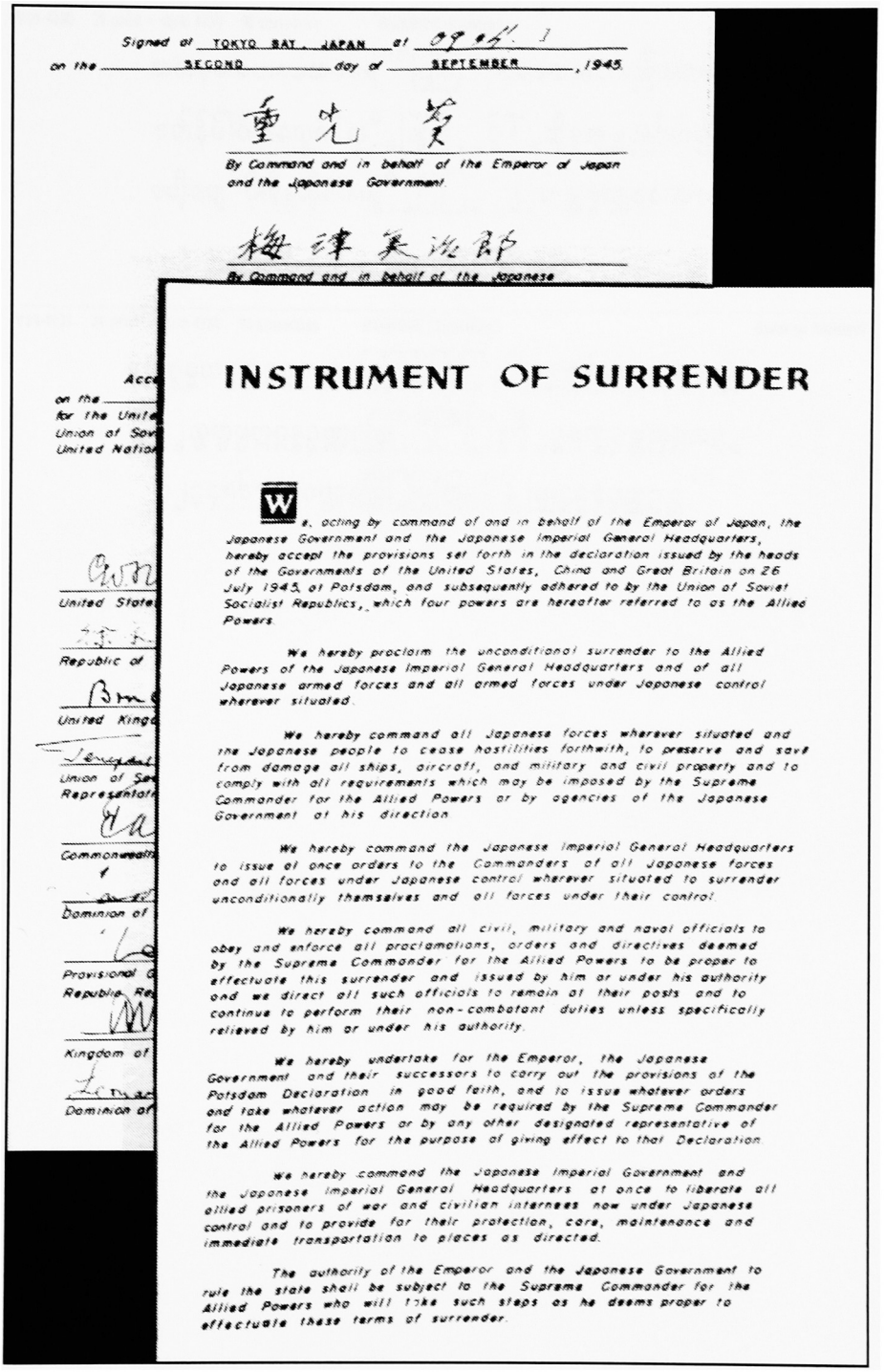
[PAGE 6.5]

Figure 6.7
Example of Mimeographing

From Coxhead Corporation brochure *Varityper . . the key to low cost duplicating and printing*

[page 6.8]





Signed at TOKYO BAY, JAPAN at 09 04
on the SECOND day of SEPTEMBER, 1945

By Command and in behalf of the Emperor of Japan and the Japanese Government

By Command and in behalf of the Japanese

Acc
on the
for the Unite
Union of Sov
United Natio

United State

Republic of

United King

Union of So
Representat

Commonwealth

Dominion of

Provisional G
Republic Re

Kingdom of

Dominion of

INSTRUMENT OF SURRENDER

We, acting by command of and in behalf of the Emperor of Japan, the Japanese Government and the Japanese Imperial General Headquarters, hereby accept the provisions set forth in the declaration issued by the heads of the Governments of the United States, China and Great Britain on 26 July 1945, at Potsdam, and subsequently adhered to by the Union of Soviet Socialist Republics, which four powers are hereafter referred to as the Allied Powers.

We hereby proclaim the unconditional surrender to the Allied Powers of the Japanese Imperial General Headquarters and of all Japanese armed forces and all armed forces under Japanese control wherever situated.

We hereby command all Japanese forces wherever situated and the Japanese people to cease hostilities forthwith, to preserve and save from damage all ships, aircraft, and military and civil property and to comply with all requirements which may be imposed by the Supreme Commander for the Allied Powers or by agencies of the Japanese Government at his direction.

We hereby command the Japanese Imperial General Headquarters to issue at once orders to the Commanders of all Japanese forces and all forces under Japanese control wherever situated to surrender unconditionally themselves and all forces under their control.

We hereby command all civil, military and naval officials to obey and enforce all proclamations, orders and directives deemed by the Supreme Commander for the Allied Powers to be proper to effectuate this surrender and issued by him or under his authority and we direct all such officials to remain at their posts and to continue to perform their non-combatant duties unless specifically relieved by him or under his authority.

We hereby undertake for the Emperor, the Japanese Government and their successors to carry out the provisions of the Potsdam Declaration in good faith, and to issue whatever orders and take whatever action may be required by the Supreme Commander for the Allied Powers or by any other designated representative of the Allied Powers for the purpose of giving effect to that Declaration.

We hereby command the Japanese Imperial Government and the Japanese Imperial General Headquarters at once to liberate all allied prisoners of war and civilian internees now under Japanese control and to provide for their protection, care, maintenance and immediate transportation to places as directed.

The authority of the Emperor and the Japanese Government to rule the state shall be subject to the Supreme Commander for the Allied Powers who will take such steps as he deems proper to effectuate these terms of surrender.

Figure 6.8
Sections of the WWII Japanese surrender document prepared by the Varityper on the *USS Missori*

From Varityper brochure *. . the story behind President Wilson's typewriter*

[PAGE 6.14]

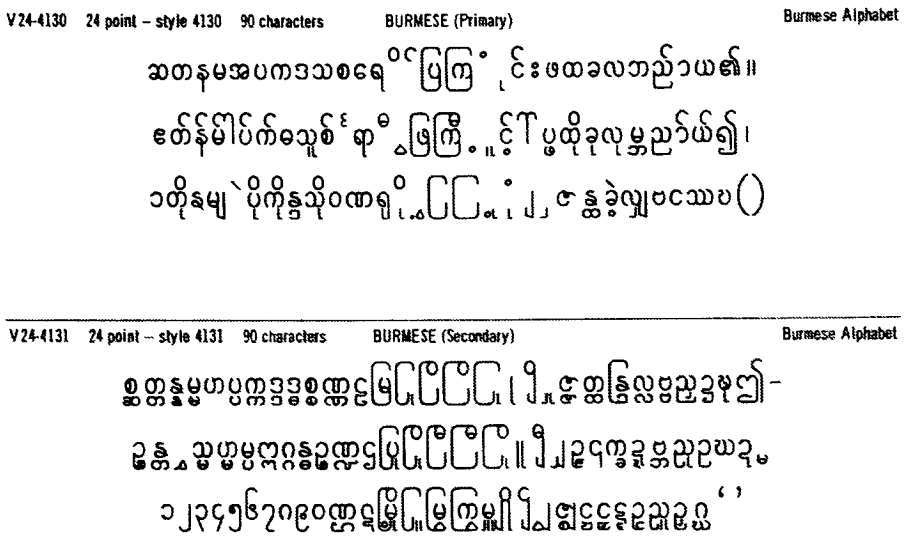
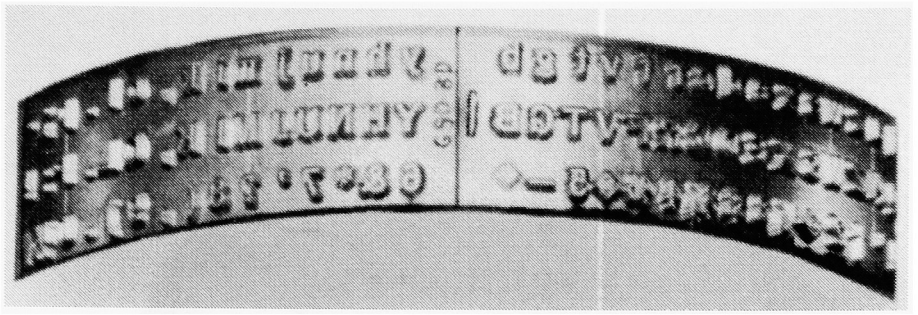


Figure 6.9 Sample of Varityper type designs made for psychological warfare

From AM International leaflet

[PAGE 6.15]



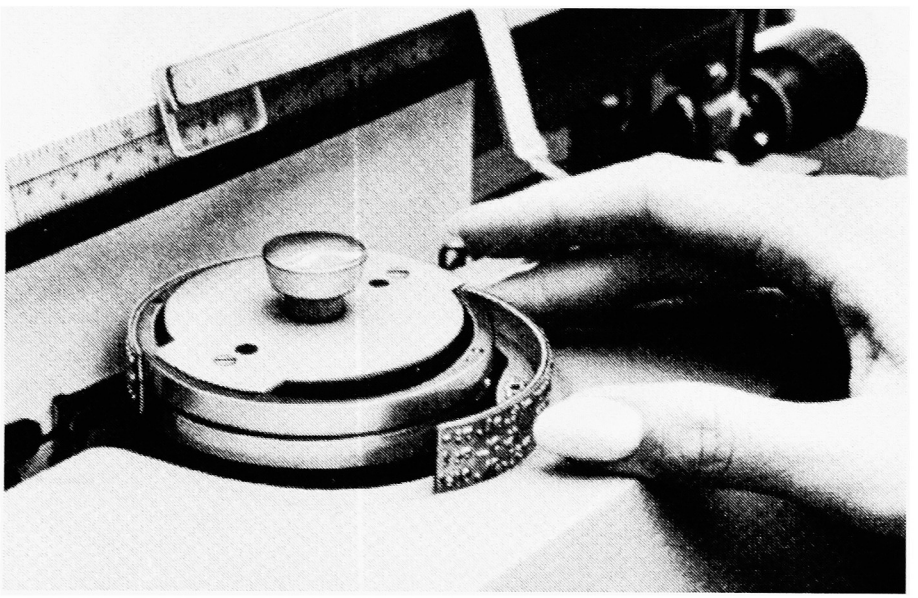


Figure 6.10
Example of a Varityper machine font and placement

From brochure *Varityper 720: The Office Composing Machine*

[page 6.16]

Figure 6.11
IBM Selectric and the golf ball

From IBM brochure

[page 6.19]

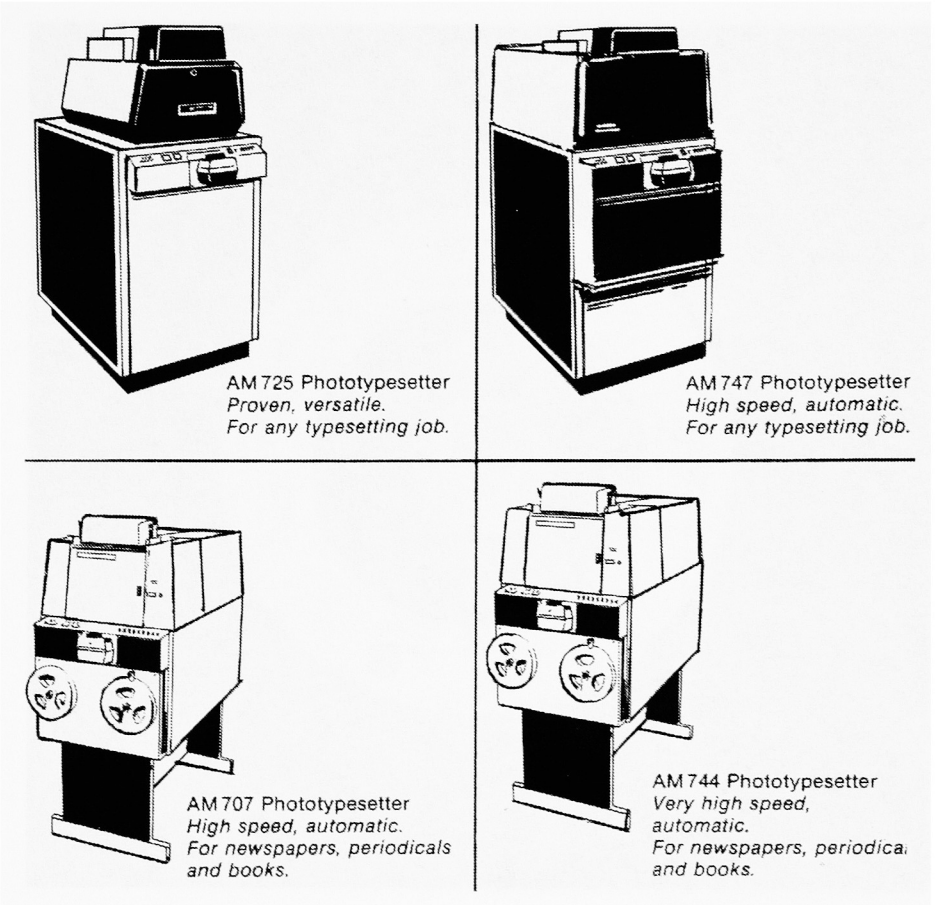


Figure 6.12 Varityper phototypesetting models starting left and going clockwise—AM 725, AM 747, AM 707, and AM 744

From brochure *The New World of Phototypesetting/ Varityper Phototypesetting Systems*

[PAGE 6.21 & 7.24]

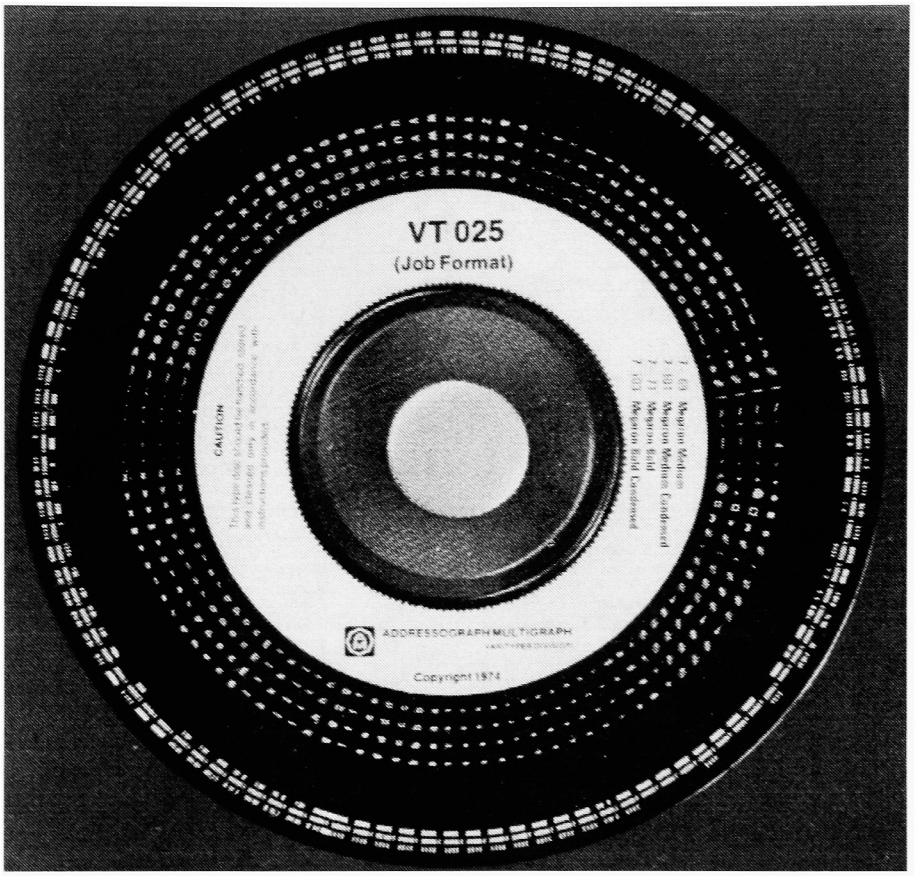
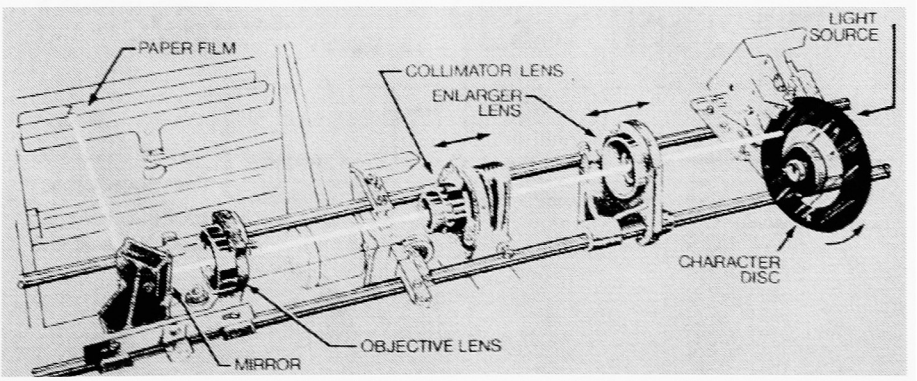


Figure 6.13
Example of a plastic disc for phototypesetting

From a Greek brochure *Comp/Set 550–560*

[PAGE 6.21]



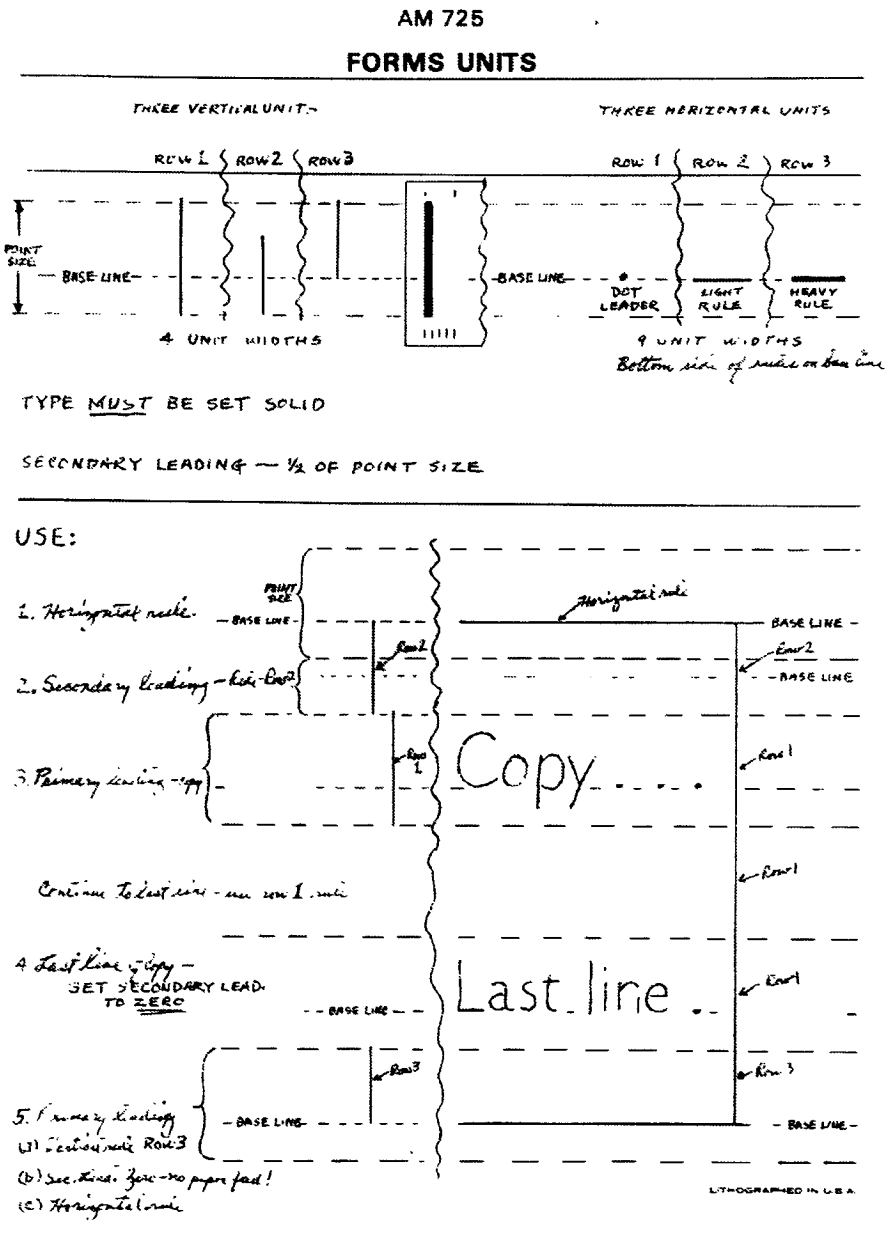


Figure 6.14
A sample sheet showing ruling characters on the first AM 725 discs in Bently's handwriting

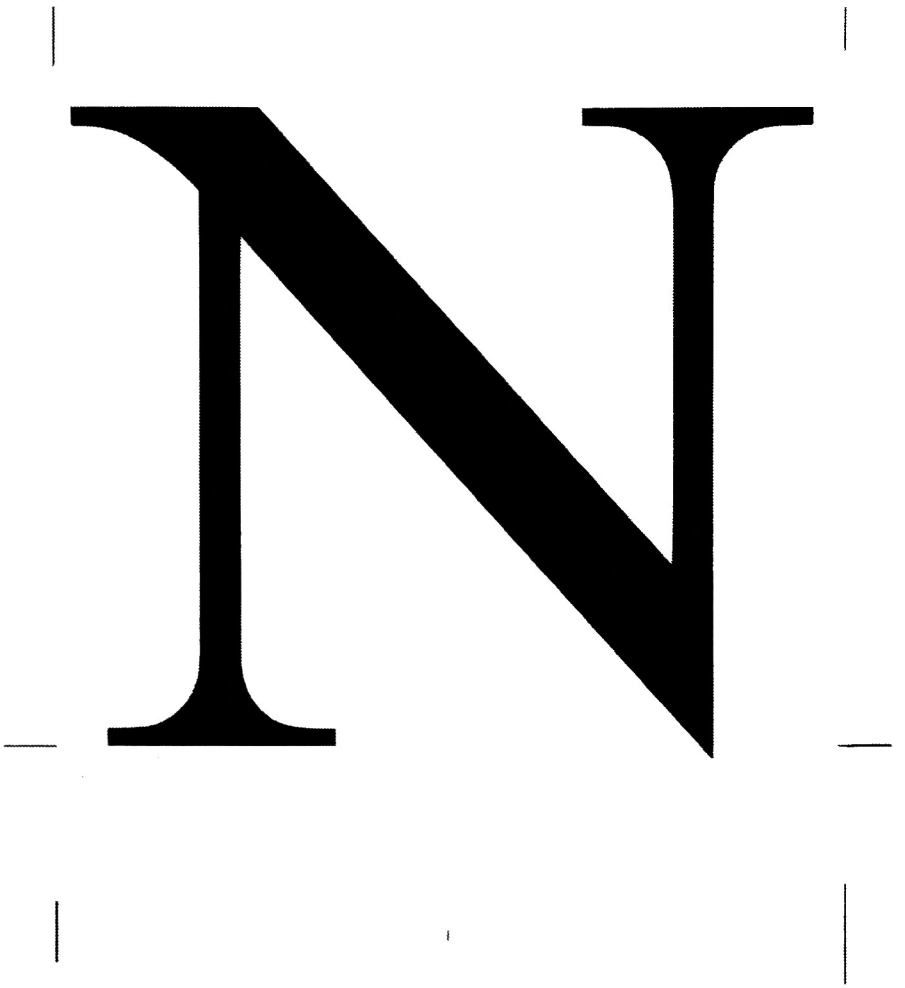
The horizontal and vertical rules were added to allow people to do forms and ruling

[PAGE 6.22]

Figure 6.15
A white print used by Photon and AM as a lettercard to shoot a disc

70% actual size

[PAGE 6.22]



TIMES NEW ROMAN 43 (15)

Figure 6.16
A Japanese sample cut out of rubylith that the designer cut by hand

Black image area is red on original

70% actual size

[page 6.24]

Figure 6.17
Comp/Set 500

From brochure
Comp/Set 500
Direct Entry
Phototypesetter

[page 6.27]

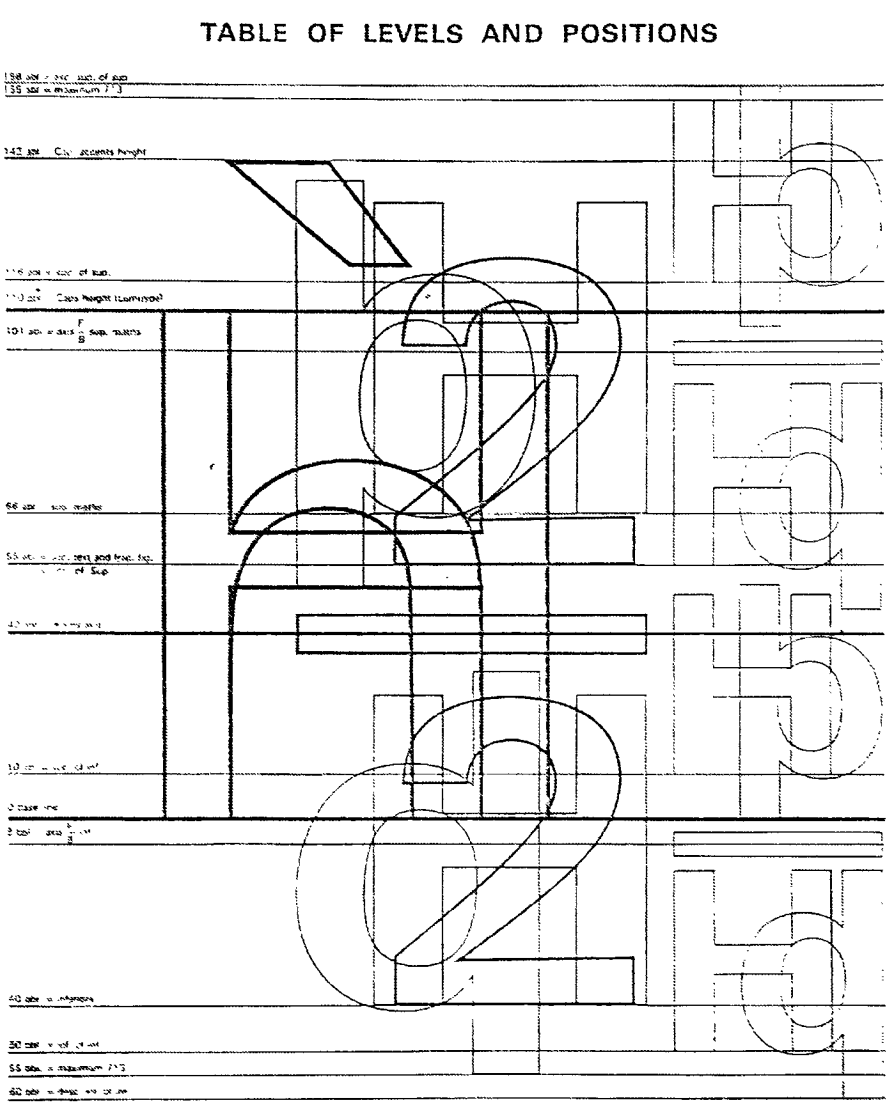


Figure 6.18
A drawing of the design limitations during the Photon era

[PAGE 6.28]

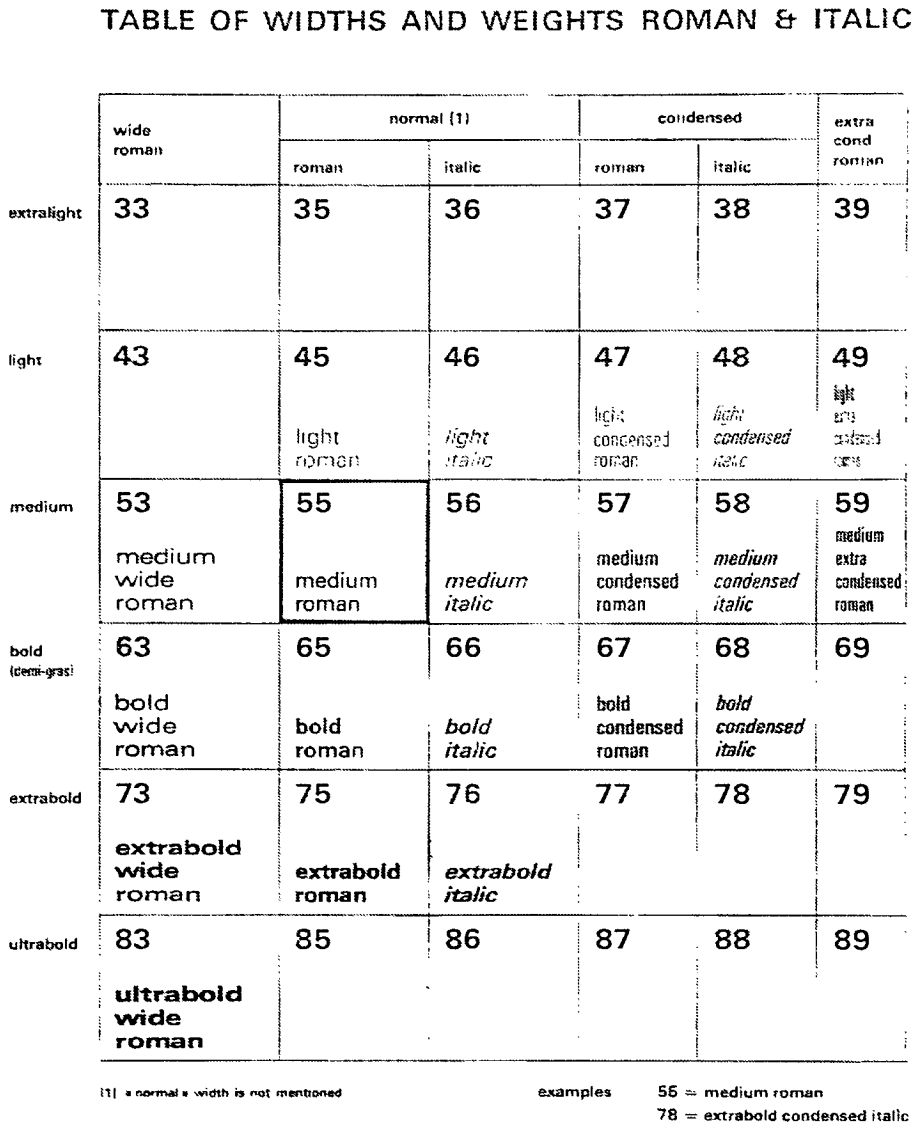


Figure 6.19
Univers designed by Frutiger, probably from the Paris studio

[PAGE 6.29]

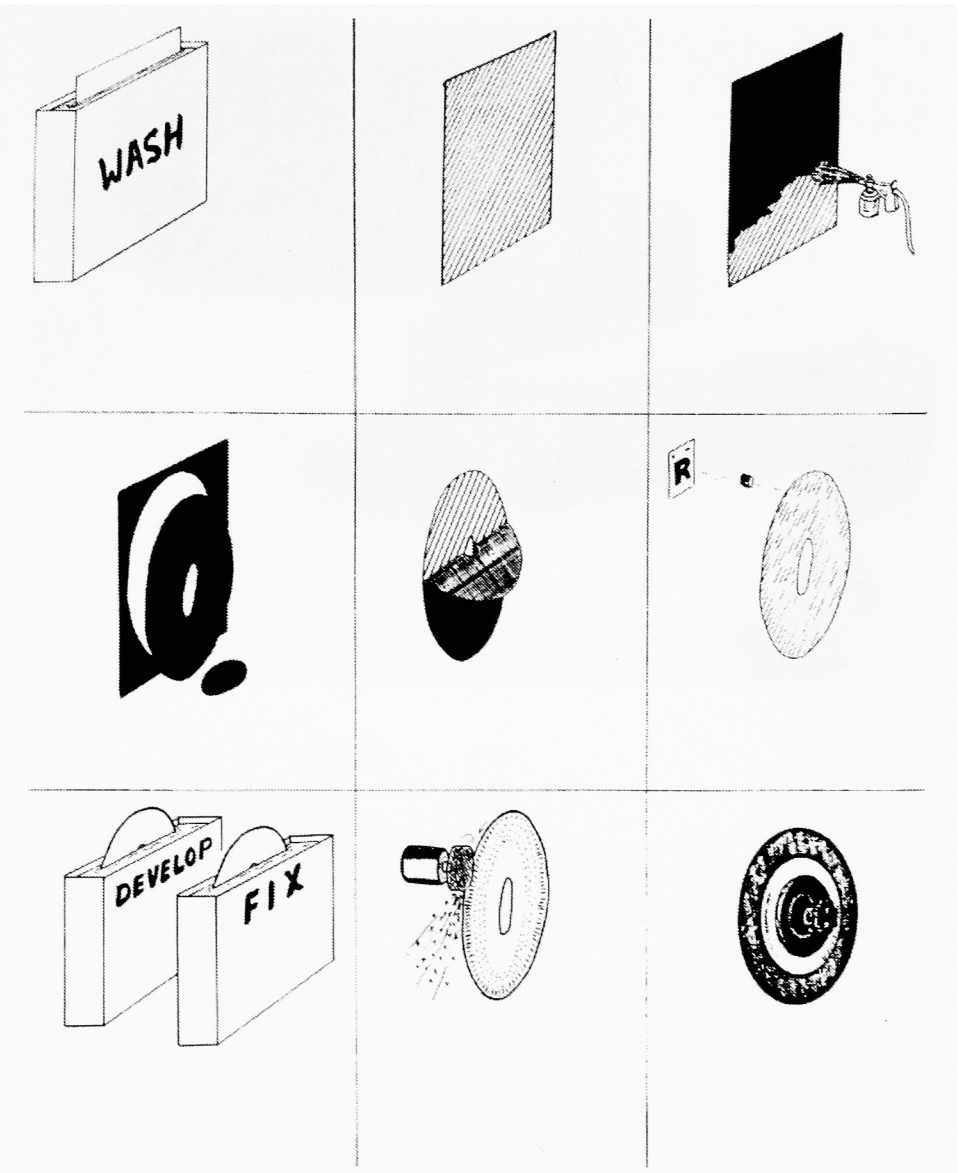


Figure 6.20
Process for making glass discs at Photon

[page 6.30]

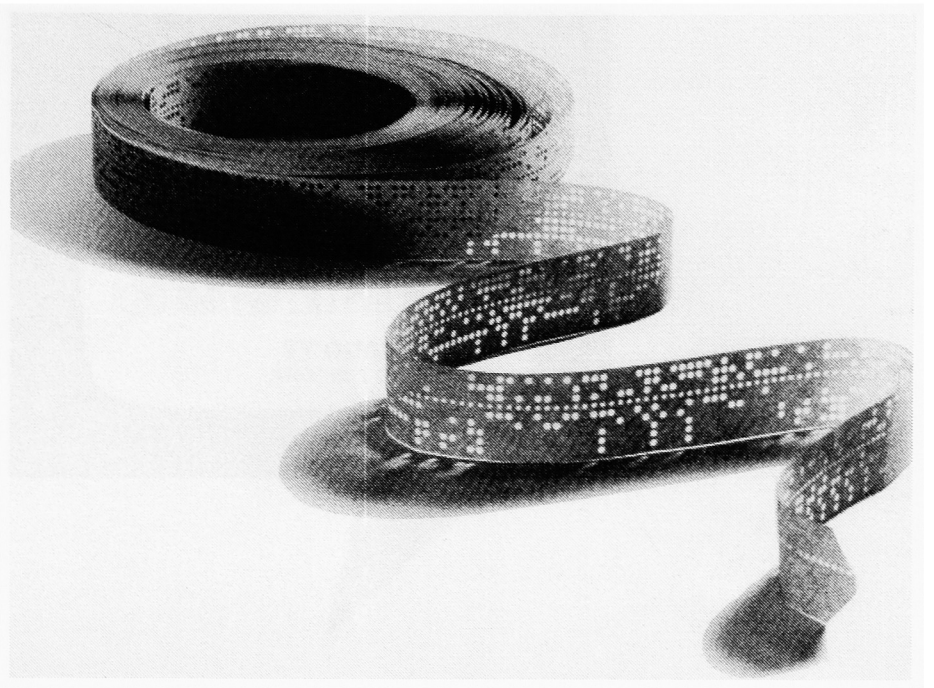


Figure 6.21
Photon
paper tape

From brochure
The Photon 7000 CRT Phototypesetter and what it means to you

[page 6.31]

Figure 6.22 Specialty font product applications

From brochures *TV Quadrifont* and *Astro Font* produced for the Itek Quadritek

[PAGE 6.32]

Figure 6.23

Example of character numbering system

[PAGE 6.36]

MULTINATIONAL

CHAR. CODE	DESCRIPTION	CHAR. CODE	DESCRIPTION
33	Exclamation	72	U/C H
34	Second or Inch Measurement	73	U/C I
35	Number Sign	74	U/C J
36	Dollar Sign	75	U/C K
37	Percent	76	U/C L
38	Ampersand	77	U/C M
39	Unquote	78	U/C N
40	Open Parenthesis	79	U/C O
41	Close Parenthesis	80	U/C P
42	Asterisk Reference Mark	81	U/C Q
43	Plus Sign	82	U/C R
44	Comma	83	U/C S
45	Hyphen	84	U/C T
46	Period	85	U/C U
47	Slash	86	U/C V
48	Zero	87	U/C W
49	One	88	U/C X
50	Two	89	U/C Y
51	Three	90	U/C Z
52	Four	91	Open bracket
53	Five	92	Reverse Slash
54	Six	93	Close Bracket
55	Seven	94	Circumflex lc floating accent
57	Nine	95	Underscore
58	Colon	96	Quote
59	Semicolon	97	L/C a
60	less than math symbol	98	L/C b
61	Equal sign	99	L/C c
62	greater than math symbol	100	L/C d
63	Question	101	L/C e
64	at Cost	102	L/C f
65	uppercase A	103	L/C g
66	U/C B	104	L/C h
67	U/C C	105	L/C i
68	U/C D	106	L/C j
69	U/C E	107	L/C k
70	U/C F	108	L/C l
71	U/C G	109	L/C m
		110	L/C n

Figure 7.1
Original Helvetica design by Max Miedinger

From brochure *From Helvetica to Haas Unica*

[PAGE 7-4]

Figure 3.2
A listing of the variations of Helvetica

From *Typeface Analogue* by W.F. Wheatley for the National Composition Association

[PAGE 3-5]

Helvetica (Merg)
Akzidenz-Grotesk Buch (Berthold)
Aristocrat (AM)
Claro (Alphatype)
Europa Grotesk (Scangraphic)
Geneva (Autologic)
Hamilton (QMS)
Helios (CG)
Megaron (AM)
Newton (Unitex)
Sonoman Sanserif (IBM)
Spectra (III)
Triumvurate (CG)
Vega (Harris)

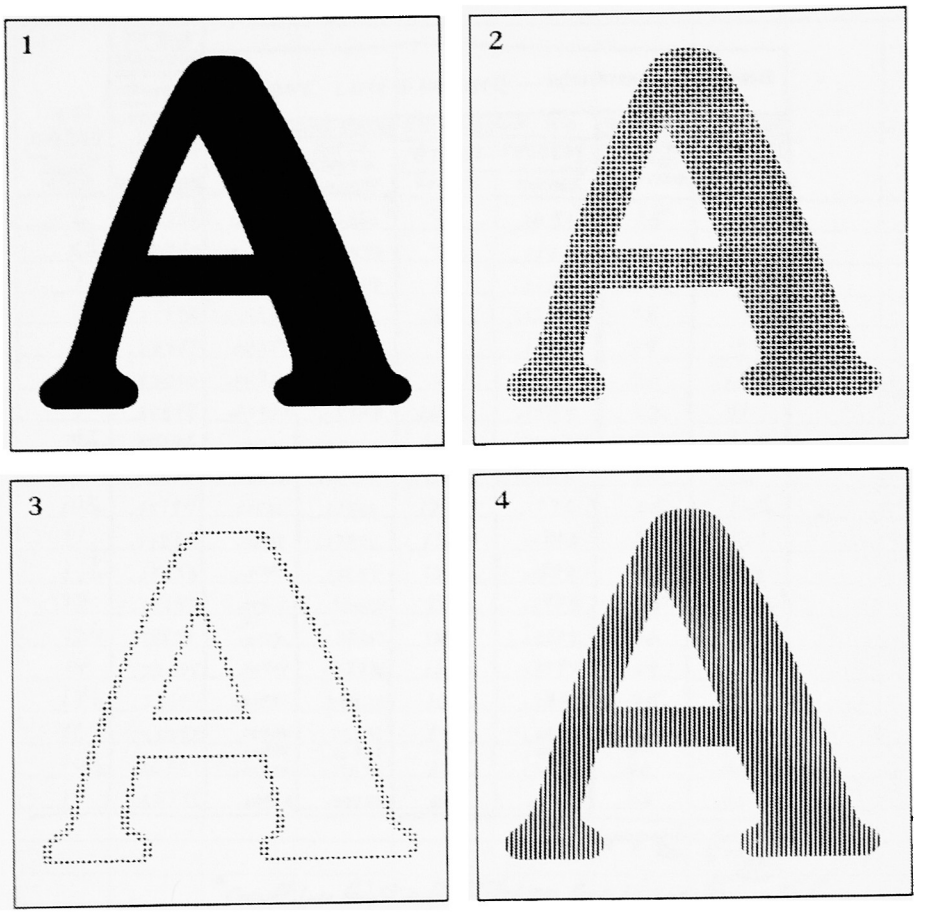


Figure 7.3
Decisions to be made at the edges of the character for defining shape

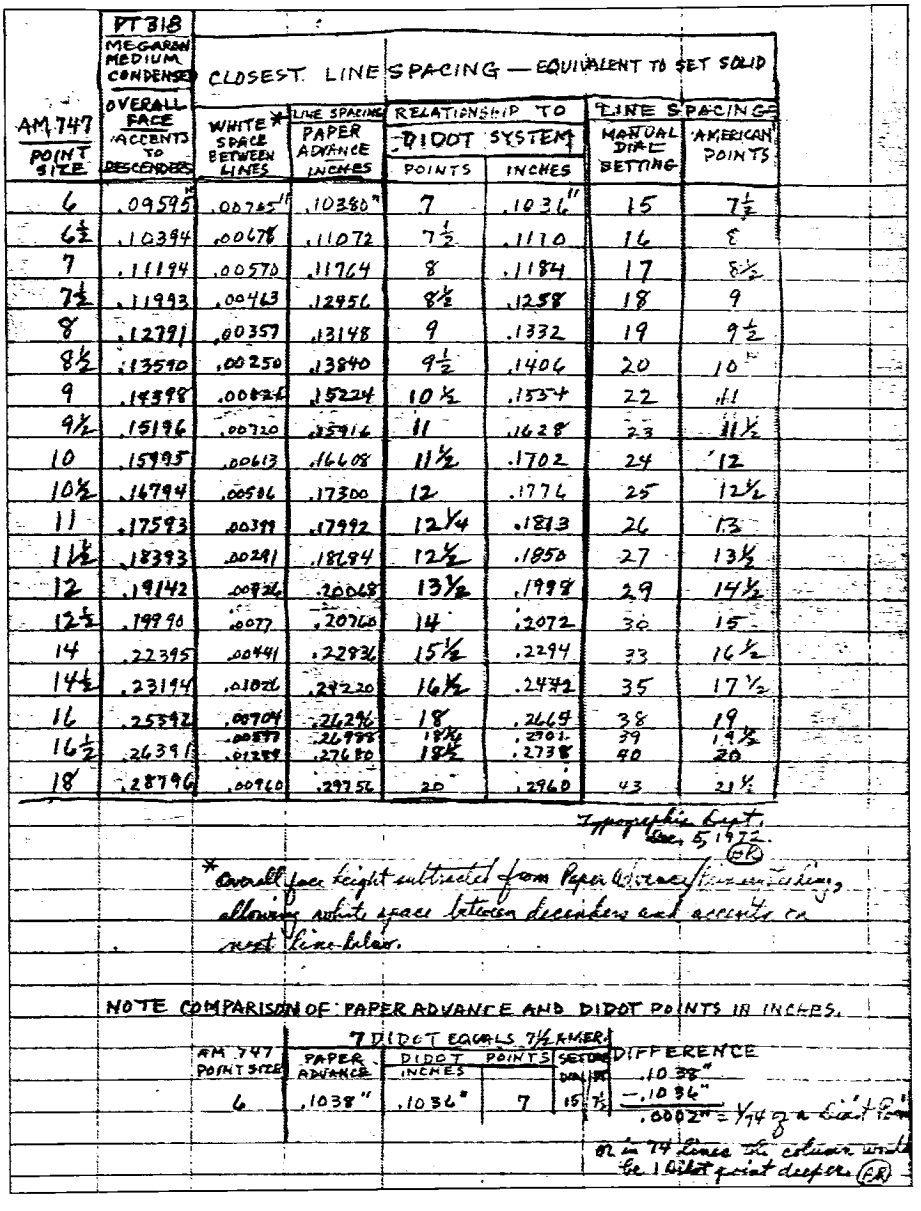
From brochure *Digitized Typography* 5/81

[PAGE 7.10]

1. An artist draws a character
2. The characters are broken down into data elements by a computerized scanning device.
3. The computer forms a mathematical outline of the character from the data elements.
4. The CRT beams paint vertical strokes from one point on the outline to another to form the final character (in actuality the vertical strokes overlap).

Figure 7.4
Example of Bently Raak's calculations for the Megaron typeface design

[PAGE 7.11]



PT 318
MEGARON MEDIUM CONDENSED

CLOSEST LINE SPACING — EQUIVALENT TO SET SOLID

AM 747 POINT SIZE	OVERALL FACE (ACCENTS TO DESCENDERS)	WHITE SPACE BETWEEN LINES *	LINE SPACING PAPER ADVANCE INCHES	RELATIONSHIP TO DIDOT SYSTEM POINTS	RELATIONSHIP TO DIDOT SYSTEM INCHES	LINE SPACING MANUAL DIAL SETTING	LINE SPACING AMERICAN POINTS
6	.09595"	.00765"	.10360"	7	.1036"	15	7½
6½	.10394	.00678	.11072	7½	.1110	16	8
7	.11194	.00570	.11764	8	.1184	17	8½
7½	.11993	.00463	.12456	8½	.1258	18	9
8	.12791	.00357	.13148	9	.1332	19	9½
8½	.13590	.00250	.13840	9½	.1406	20	10
9	.14398	.00826	.15224	10½	.1554	22	11
9½	.15196	.00720	.15916	11	.1628	23	11½
10	.15995	.00613	.16608	11½	.1702	24	12
10½	.16794	.00506	.17300	12	.1776	25	12½
11	.17593	.00399	.17992	12¼	.1813	26	13
11½	.18393	.00291	.18684	12½	.1850	27	13½
12	.19142	.00926	.20068	13½	.1998	29	14½
12½	.19990	.0077	.20760	14	.2072	30	15
14	.22395	.00441	.22836	15½	.2294	33	16½
14½	.23194	.01026	.24220	16½	.2442	35	17½
16	.25592	.00709	.26298	18	.2664	38	19
16½	.26391	.00593 / .01389	.27680	18¼ / 18½	.2701 / .2738	39 / 40	19½ / 20
18	.28796	.00960	.29756	20	.2960	43	21½

Typographic Dept. Dec. 5, 1972. (ER)

* Overall face height subtracted from Paper Advance/line spacing, allowing white space between descenders and accents on next line below.

NOTE COMPARISON OF PAPER ADVANCE AND DIDOT POINTS IN INCHES.

7 DIDOT EQUALS 7½ AMER.

AM 747 POINT SIZE	PAPER ADVANCE	DIDOT POINTS INCHES		SETTING DIAL	SETTING ½	DIFFERENCE
6	.1038"	.1036"	7	15	½	.1038" − .1036" = .0002" = 1/74 of a Didot point

or in 74 lines the column would be 1 Didot point deeper. (ER)

Figure 7.5
Example of language specific hyphenation rules

[PAGE 7.12]

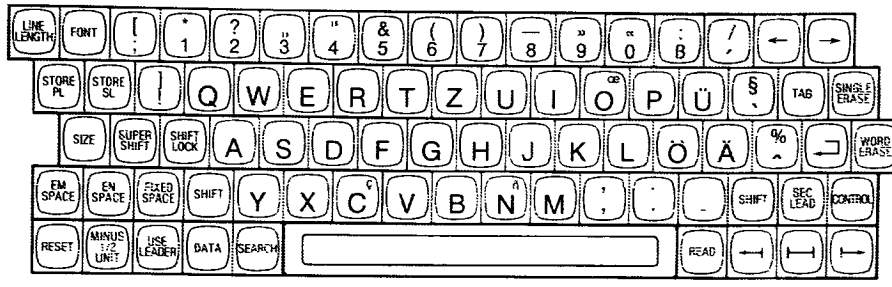
HYPHENATION RULES FOR SPANISH

1. Never divide a word of less than five letters.
2. Never divide after one letter of a word-there must be at least two letters on the first line with a carryover of at least three letters to the following line.
3. Always divide before the ch, double l (ll), double r (rr), ñ, q and y.
4. Always divide after a vowel when it is followed by a single consonant.
5. When a vowel is followed by a double or triple consonant, the first letter of which is b, c, d, l, m, n, r, s or x, then divide after these letters. (Exceptions br. bi, dr)
6. Always split the double o (oo) and double e (ee).
7. Diphthongs ie, iu, io, ia, ei, ai, au, ui, ue, ua, uo, should never be split.

Figure 7.6
Examples of different keyboard layouts

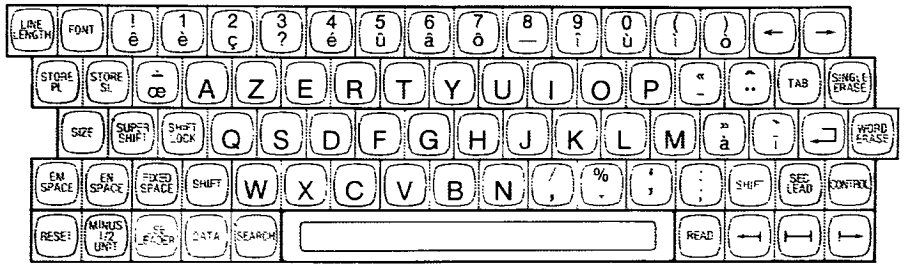
[PAGE 7.14]

GERMAN
COMP/SET 550 KEYBOARD



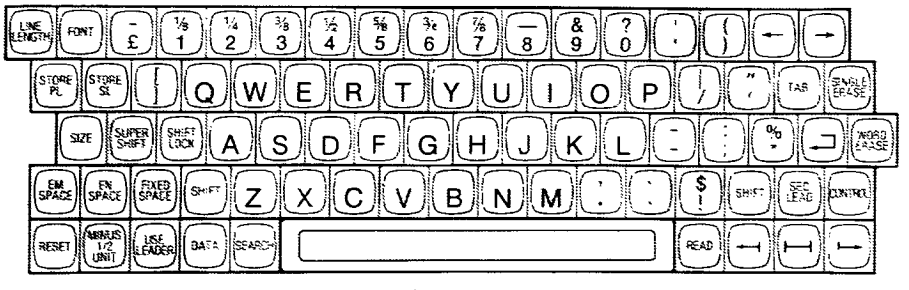
aäbcdefghijklmnoöpqrsßtuüvwxyz
AÄBCDEFGHIJKLMNOÖPQRSTUÜVWXYZ

FRENCH/ITALIAN
COMP/SET 550 KEYBOARD



aàâbcçdeèéêfghiîïjklmnoòôœpqrstuùûvwxyz
ABCÇDEÈÉÊFGHIJKLMNOŒPQRSTUVWXYZ

UNITED KINGDOM
COMP/SET 550 KEYBOARD

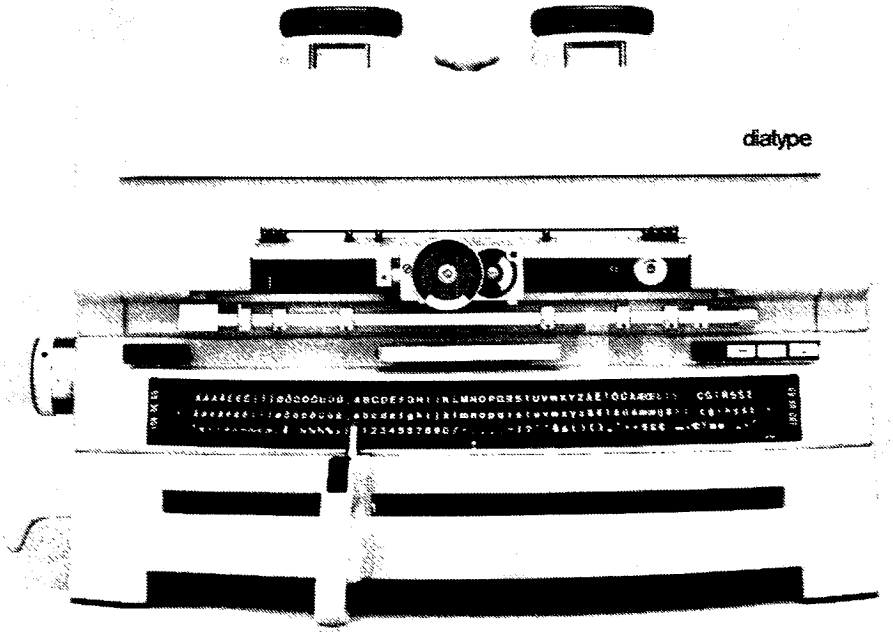


abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Figure 7.7
Example of a
Diatype machine

From brochure
Berthold Diatype

[PAGE 7.20]



Bayaan بيـــان

قال عمر بن الخطّاب رضي الله عنه :
أحسنُ الخـــط أبينه وأبين الخـــط أحسنه .
ويضيف عبد الله بن طاهر : حسن الخط يناضل
عن صاحبه ويوضح الحجة ويمكنه من درك البغية .

قال عمر بن الخطّاب رضي الله عنه :
أحسنُ الخـــط أبينه وأبين الخـــط أحسنه .
ويضيف عبد الله بن طاهر : حسن الخط يناضل
عن صاحبه ويوضح الحجة ويمكنه من درك البغية .

قال عمر بن الخطّاب رضي الله عنه :
أحسنُ الخـــط أبينه وأبين الخـــط أحسنه .
ويضيف عبد الله بن طاهر : حسن الخط يناضل
عن صاحبه ويوضح الحجة ويمكنه من درك البغية

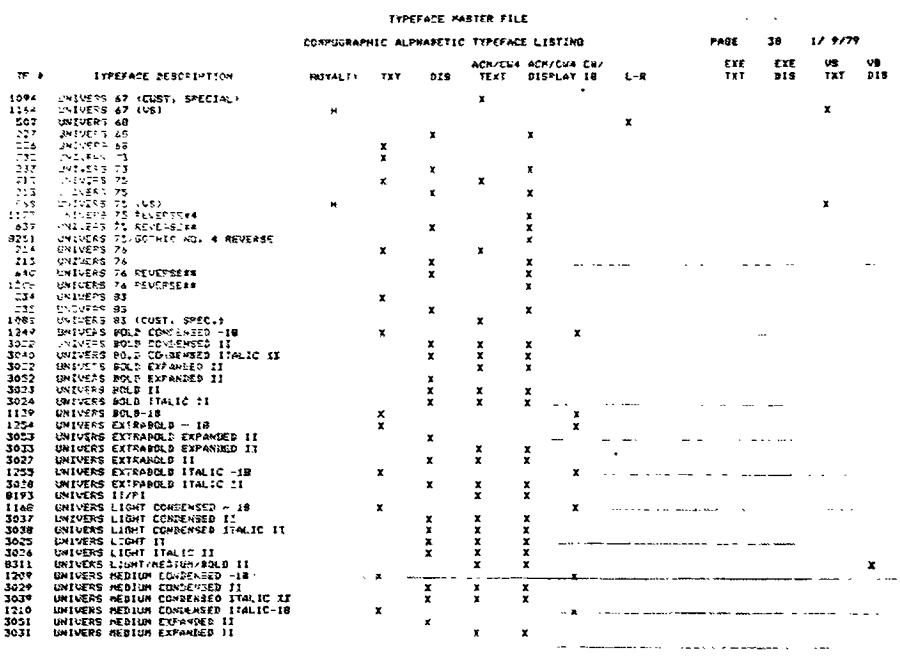
Figure 7.8
A sample of Arabic designed by the AM designers in Europe

From leaflet *AM new type release—Bayaan*

[PAGE 7.23]

Figure 8.1
Sample of the typeface listings for Compugraphic

[PAGE 8.1]



TYPEFACE MASTER FILE

COMPUGRAPHIC ALPHABETIC TYPEFACE LISTING — PAGE 38 — 1/ 9/79

TF #	TYPEFACE DESCRIPTION	ROYALTY	TXT	DIS	ACM/EM4 TEXT	ACM/CWA DISPLAY	CW/ 18	E-R	EXE TXT	EXE DIS	VS TXT	VB DIS
1094	UNIVERS 67 (CUST. SPECIAL)				X							
1164	UNIVERS 67 (VS)	H									X	
567	UNIVERT 68							X				
227	UNIVERS 69			X		X						
236	UNIVERS 69		X									
235	UNIVERS 71		X									
237	UNIVERS 73			X		X						
217	UNIVERS 75		X		X							
213	UNIVERS 75			X		X						
759	UNIVERS 75 (VS)	H									X	
1127	UNIVERS 75 REVERSE#4					X						
637	UNIVERS 75 REVERSE##			X		X						
8251	UNIVERS 75/GOTHIC NO. 4 REVERSE					X						
214	UNIVERS 76		X		X							
215	UNIVERS 76			X		X						
440	UNIVERS 76 REVERSE##			X		X						
1206	UNIVERS 76 REVERSE##					X						
234	UNIVERS 83		X									
235	UNIVERS 85			X		X						
1083	UNIVERS 83 (CUST. SPEC.)				X							
1249	UNIVERS BOLD CONDENSED -18		X				X					
3022	UNIVERS BOLD CONDENSED II			X	X	X						
3040	UNIVERS BOLD CONDENSED ITALIC II			X	X	X						
3032	UNIVERS BOLD EXPANDED II				X	X						
3052	UNIVERS BOLD EXPANDED II			X								
3023	UNIVERS BOLD II			X	X	X						
3024	UNIVERS BOLD ITALIC II			X	X	X						
1139	UNIVERS BOLD-18		X				X					
1254	UNIVERS EXTRABOLD — 18		X				X					
3053	UNIVERS EXTRABOLD EXPANDED II			X								
3033	UNIVERS EXTRABOLD EXPANDED II				X	X						
3027	UNIVERS EXTRABOLD II			X	X	X						
1253	UNIVERS EXTRABOLD ITALIC -18		X				X					
3028	UNIVERS EXTRABOLD ITALIC II			X	X	X						
8193	UNIVERS II/PI				X	X						
1168	UNIVERS LIGHT CONDENSED — 18		X				X					
3037	UNIVERS LIGHT CONDENSED II			X	X	X						
3038	UNIVERS LIGHT CONDENSED ITALIC II			X	X	X						
3025	UNIVERS LIGHT II			X	X	X						
3026	UNIVERS LIGHT ITALIC II			X	X	X						
8311	UNIVERS LIGHT/MEDIUM/BOLD II				X	X						X
1209	UNIVERS MEDIUM CONDENSED -18		X				X					
3029	UNIVERS MEDIUM CONDENSED II			X	X	X						
3039	UNIVERS MEDIUM CONDENSED ITALIC II			X	X	X						
1210	UNIVERS MEDIUM CONDENSED ITALIC-18		X				X					
3051	UNIVERS MEDIUM EXPANDED II			X								
3031	UNIVERS MEDIUM EXPANDED II				X	X						

Figure 8.2
Compugraphic introduction for Garth Graphic

From brochure *Garth Graphic* 7/79

[PAGE 8.1]

Garth Graphic

WITH SMALL CAPS

Italic

Bold

Bold Italic

Extrabold

Condensed

Bold Condensed

Garth Graphic is a new typeface family designed exclusively for Compugraphic by Renée LeWinter and Constance Blanchard at Compugraphic headquarters in Wilmington, Massachusetts. Garth Graphic is named for William W. Garth Jr., co-founder of Compugraphic. This type family is a tribute to his role as a pioneer in the phototypesetting industry. Its superior legibility, medium weight and even shading make Garth Graphic adaptable to many uses. It is truly a typeface for our times.

This 54 unit typeface is available from Compugraphic in a text/display (6 through 72 point) character design.

Figure 8.3
Introduction
from Itek for
Matt Antique

From specimen
folder *Matt*
Antique

[PAGE 8.1]

MATT ANTIQUE

is a welcome addition to the Quadritek typeface library. This original oldstyle typeface designed for phototypesetting by John Matt and dormant for many years has now been revived for use on the Quadritek. The fit of Matt Antique has been adapted to the improved capabilities of the Quadritek but otherwise it is true to the original. It is available in medium weight with matching Italic and Bold. A small cap pi font with ligatures & old style numerals will be forthcoming. These four segments in the Quadritek will allow extensive typesetting applications. The weight and characteristics of this style make it a versatile all-around face adaptable to a wide variety of applications. It won't be one to sit on-the-shelf for 11 months out of the year. Your operator, your platemaker and your pressman will love it because it won't give them a problem. It communicates well in all platemaking and printing methods, and its weight is enough to minimize sizing problems and allow the use of other than black printing ink. Some typefaces just seem to do their job better, & Matt Antique, we think you'll agree, is one of this select group.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz&1234567890

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz&1234567890

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz&1234567890

Matt Antique

BILL WHEATLEY

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
1234567890 .,:;'"«»§&!?

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
1234567890 .,:;'"«»§&!?

Figure 8.4
Bill Wheatley's article about Matt Antique

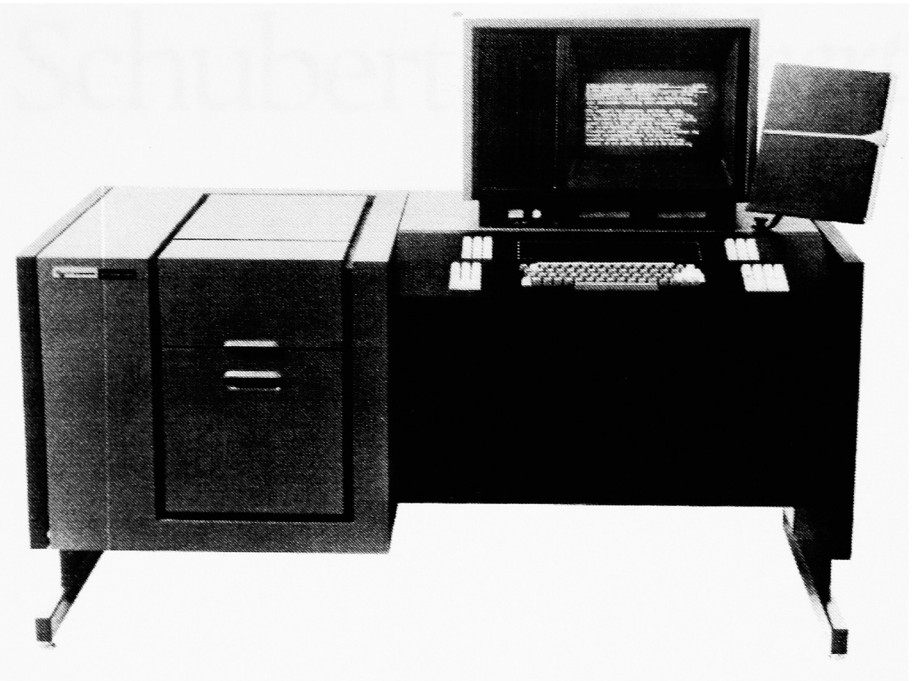
From *Types Best Remembered, Types Best Forgotten* by Robert Norton

[PAGE 8.1]

Figure 8.5
Example of
Compugraphic
EditWriter 7500

From brochure
Compugraphic
EditWriter 7500

[page 8.4]



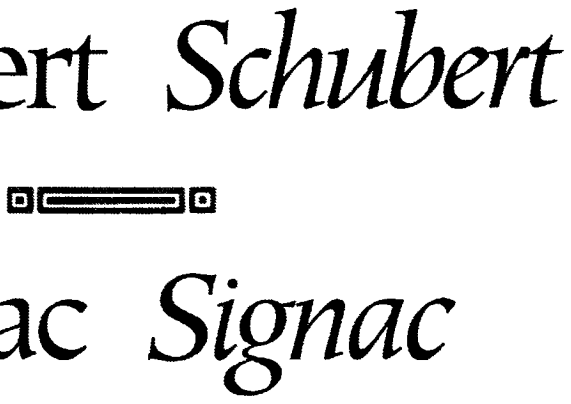


Figure 8.6
Examples of Cynthia Hollingsworth's Typefaces

From a typeface specimen sheet of High Technology Solutions

[PAGE 8.5]

Figure 8.7
A listing of the languages that HTS serviced

From brochure: *HTS Software Products Languages Supported by the Multilanguage Publishing System 4/86*

[PAGE 8.6]

LANGUAGES

*Abua
Acholi
Afrikaans
Albanian
Amharic
*Amis
Arabic
Armenian
*Assamese
*Assyrian
Ateso
Bambara
*Bamileke
Bari
Baoule
*Bassa (Cameroon)
Bassa (Liberia)
Batak Karo
Batak (Sumatra)
*Batak Toba
*Bengali
*Biak
Bicol
Bislama
*Boulou
*Bukidnon
Bulgarian
*Burmese
*Cambodian
Cebuano
Chabacano
Chamorro
Chichewa
Chin
Chinese
Chilonga
*Chokwe
Ciberba
Cinamwanga
*Cilonga
*Creole
Croatian
Czech
Danish
*Dayak
*Dibabawon
Dinka
*Douala
Dutch
Edo
Efik
English
*Esperanto
Estonian
Ewe
*Fante
Faroese
Fijian
Finnish
French
Ga
German
Gilbertese
Gouro
Greek
Greenlandic
*Guarani
Gujarati
Gun
*Gurmukhi
Haka Chin
Hausa
Hawaiian
Haya
*Hebrew
Herero
Hiligaynon
Hindi
Hiri Motu
Houailou
*Hula
Hungarian
Icelandic
*Iban
Ibanag
Idoma
Ifugao
Igala
Igbo
*Ijaw
Iloko
Indonesian
*Inuktitut
Irish
*Iroquois
Isoko
Italian
Itsekiri
*Ivatan
*Japanese
*Javanese
*Kachin
*Kalanga
Kalenjin
*Kannada
*Karen
*Kerema
*Khasi
Kikamba
Kikaonde
Kikongo
Kikuyu
Kiluba
Kimeru
Kinyakusa
Kinyarwanda
Kinyiha
Kirundi
Kisi
Kisii
*Kiwai
*Konkani
Konkani (Roman)
Korean
Kosraean
Kpelle
Kuna
Kwale
Kwangali
Kwanyama
*Kwaraae
*Lango
*Laotian
Lifou
Lingala
Lithuanian
Lorma
*Luchazi
Luganda
Luhya
Luhya-Bunyore
Luhya-Samia
Luhya-Wanga
Luo
Lushai
Luvale
Maasai
Macedonian
Maguindanao
Malagasy
*Malay
Malayalam
Maltese
*Manipuri
*Mansaka
*Maori
Maragoli
*Maranaw
Marathi
Mare
Marquesian
Marshallese
*Masbateno
Mende
*Mere
Mono-Kutuba
Moore
Nama
*Nauruan
Ndonga
Nemba
Nepali
New Guinea Pidgin
*Nias
Niuean
Norwegian
Nupe
Nzema
Ogoni
*Oshikuambi
Otetela
Palauan
Pampango
Pangasinan
Papiamento
Pa-Zande
*Persian
Polish
Ponapean
Portuguese
*Punjabi
Rarotongan
Romanian
*Romansh
*Ronga
*Roluman
Runyankore
Russian
Rutoro
Samar-Leyte
*Sambal
Samoan
Sango
Sepedi
Serbian
*Serer
Sesotho
Seychelles-Creole
Shona
Silozi
Sinhalese
Slovak
Slovenian
Solomon Is.-Pidgin
Somali
Spanish
Sranan
Sukuma
*Sundanese
Swahili
Swahili (Zaire)
Swedish
Tagalog
Tahitian
Taita
Tamil
Tausug
*Telugu
*Thai
*Thangul
Tigrinya
Tiv
*Toanpi
Tongan
Trukese
Tshiluba
Tsonga
Tswana
Tumbuka
Turkish
Tuvaluan
Twi
Ukrainian
Umbundo
*Urdu
Urhobo
Venda
Vietnamese
Wallisian
Welsh
*Wolof
Xhosa
*Yao
Yapese
*Yergam
*Yiddish
Yoruba
Zulu

*Languages either planned or in progress but not yet available as of April 15, 1986. Please consult factory for the latest language developments.

HIGH TECHNOLOGY SOLUTIONS

ONE INDUSTRY STREET PO BOX 3426, POUGHKEEPSIE, NEW YORK 12603 USA

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Telex 4995149 HTSNY
Telefax (914) 454-1985

Figure 9.1 William Wheatley with Hermann Zapf at the DRUPA Calligraphy exhibit

[page 9.2]

Figure 9.2
Cover to the Pacesetter disc closeout

From Itek brochure *Pacesetter Users: Last Chance! Buy your custom Disc at Bargain Prices*

[PAGE 9.4]

Figure 9.3
Photograph of Ronald McIntosh (l) and Peter Purdy (r)

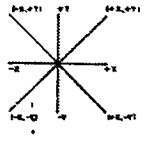
From "Twenty Years in Phototype," *Lithoprinter Week* (September 10, 1980), 59

[PAGE 9.5]

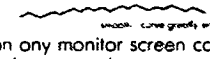
Figure 9.4
A leaflet about
Spiral Type

[PAGE 9.6]

WHAT YOU WANTED TO KNOW ABOUT SPIRAL TYPE, BUT WERE AFRAID TO ASK.



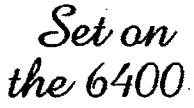
The PM Digitol Spirol looks smooth but is actually composed of 16,384 tiny steps, i.e. a series of instructions stored in computer memory.



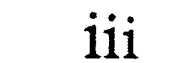
The resolution is finer than any monitor screen can show, and makes the spirol's path into an electronic equivalent of the French curve used by draughtsmen to draw curves which must join perfectly.

The spirol includes every curve that ever was used (and ever will be used) to draw the freehand flowing curves of typographic design. By fitting parts of it ("links" found by computer matching) to the outline of each typeform, the essential perfection of the original drawing is preserved within a bit-map of 16 million bits... Such resolution would be impossibly expensive but for the spirol process, which cuts the number of bits to a few thousand only.

Because of this exceptional quality, the patented spirol technique has been licensed to Varityper, USA; to Dr. Ing. Rudolf Hell, Germany; and also to Itek Corporation, USA. It is also used in certain displays to enhance legibility.



When the reproducing machine is itself of high resolution (1000 lines per inch or more), the resulting typeset output is superb.



Even when the spirol-fitted letter is reproduced by a printer of coarse resolution, the scanned or dotted letter image remains more faithful than it can be by traditional computer methods, which depend upon curves constructed from short straight lines, or use arithmetic interpolation which is less perfect than the artist's original.

WHY BOTHER WITH PERFECT TYPE, WHEN ONLY THE INFORMATION REALLY COUNTS?

Nearly all the typesetting which we read day by day, but which most people never notice, is intimately descended from type designs which are at least 200 years old. Over the years these designs have been finely tuned to fulfil the joint tasks of easy readability and communication. Thus is created the invisible quality of good type—efficient while aesthetically but unobtrusively pleasing. The digital spirol preserves that special quality through the power of modern technology.

PURDY & McINTOSH (RESEARCH) LTD 83 ST ALBANS ROAD, WATFORD WD1 1S ENGLAND

Telephone 0923-30460

Figure 9.5
Example of the Quadritek

From brochure *Itek Quadritek Fotosatzsystem*

[page 9.8]

Figure 9.6
RitaScript designed by John Schappler

From Itek poster/brochure *Famous Faces*

[page 9.8]

RitaScript

SS *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
56 *abcdefghijklmnopqrstuvwxyz1234567890*

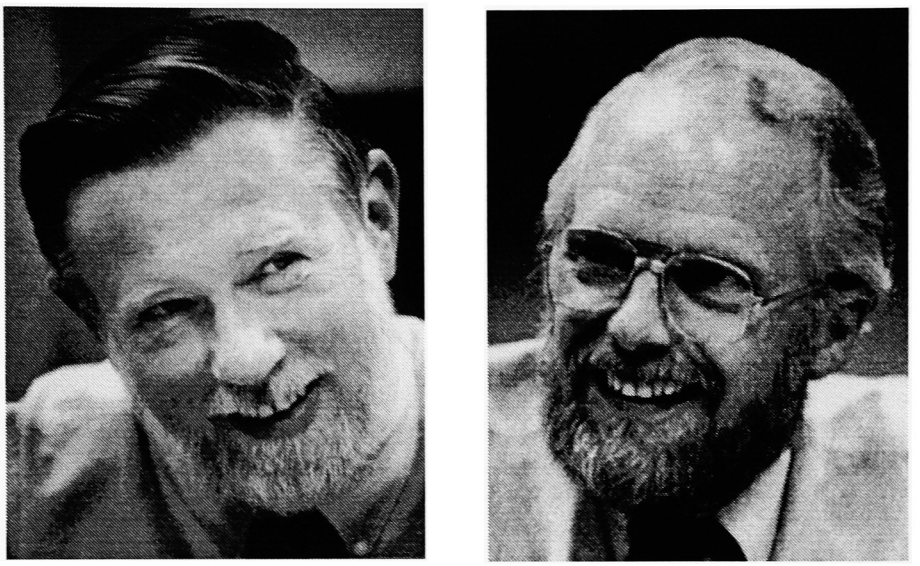


Figure 10.1 Charles Geschke and John Warnock from Adobe

From *Adobe 1991 Corporate Profile*

[page 10.8]

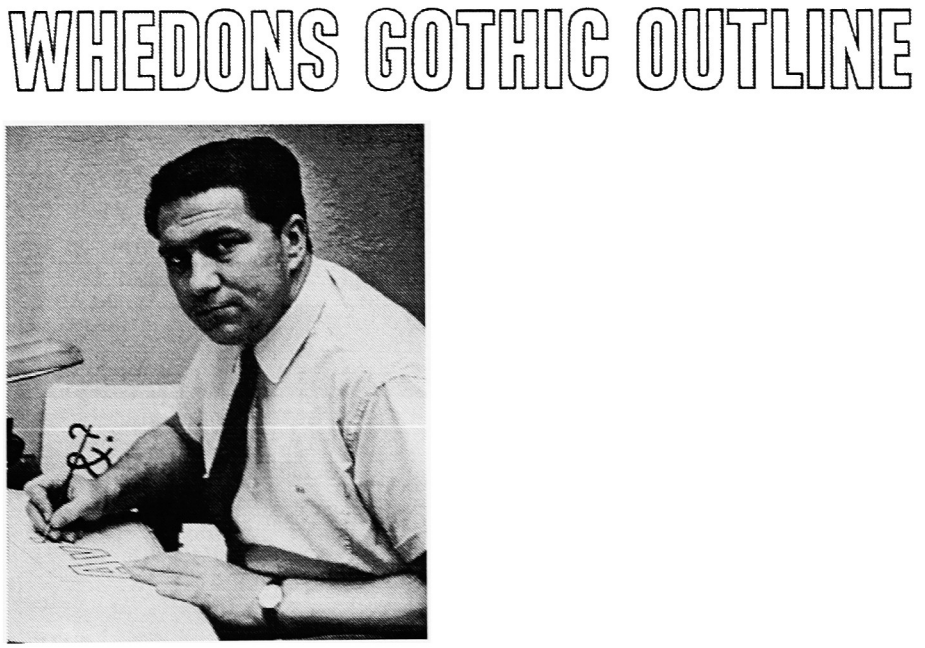


Figure 10.2 An example of Whedon Davis' typeface and picture

From typespecimen brochure *ATF proudly presents the new foundry typeface Whedons Gothic Outline*

[page 10.10]

Figure 10.3
An example of of Adrian Williams' typeface Raleigh

From FONTS spec sheet

[page 10.11]

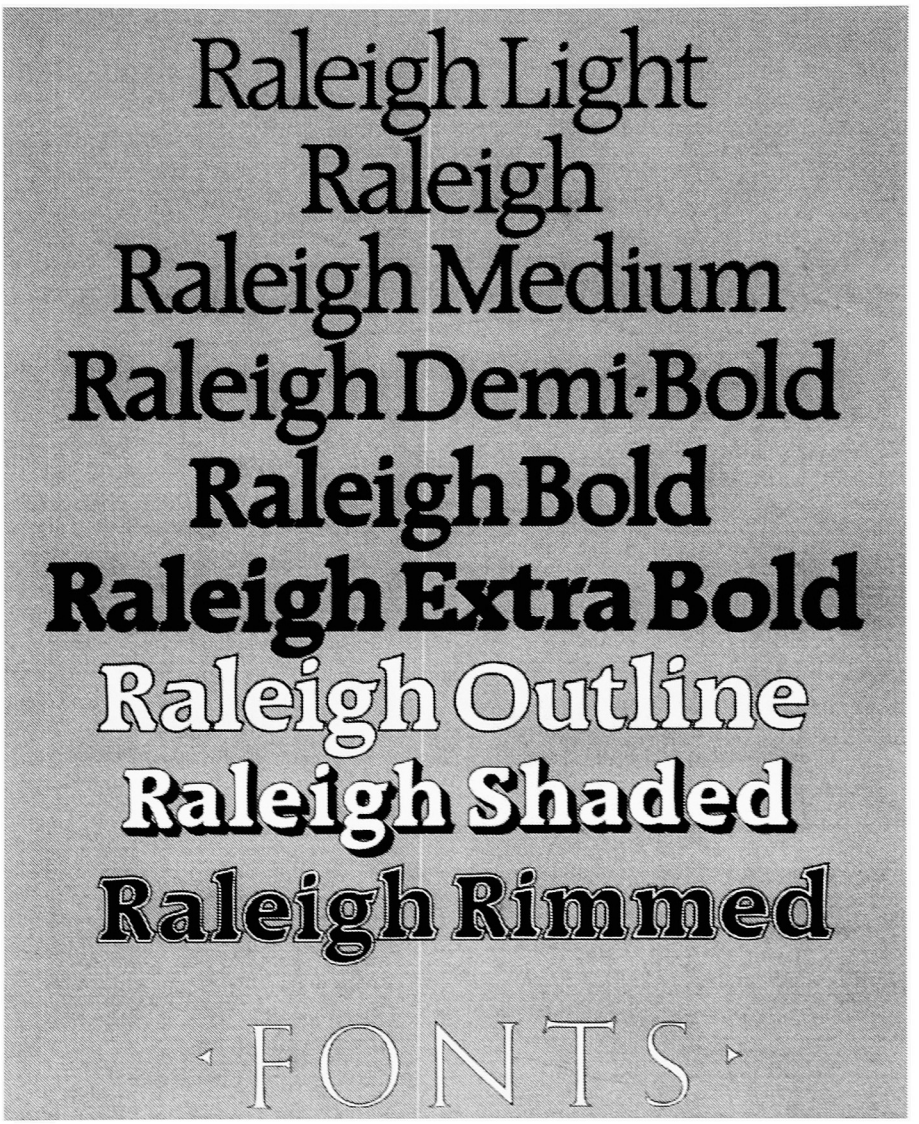


Figure 11.1
Photograph of Lawrence Wallis

From "Sanserif faces: From Metal to Film" *Lithoprinter Week* (December 19, 1984), 16

[page 11.3]

Appendix B: Varityper History and Specifications

by William F. Wheatley

Varityper History and Specifications

Many books and treatises have been written about the history of typesetting, and the development of machines from mechanically set type up to the present age of computers and laser imagery. But none to my knowledge has ever talked about an amazing machine that started its humble life as a hybrid typewriter, and evolved a technology that eventually brought it in to the main steam. It was the machine that was used in 1918 by President Woodrow Wilson to compose his "Fourteen Points."

This is a story of a machine and the people who spent their entire business careers in a secondary typesetting effort that has not really been told. The beginning of my story almost coincides with my life, so I thought that I might as well start in 1933. This was really the beginning of the path of a machine and company that would encompass my major business life.

The Varityper actually was invented by James Bartell Hammond, and was first produced in 1881. It encompassed the features that always stayed with it, that is changeable type fonts, and an open ended carriage. Hammond died in 1913, and the patents were left to the Metropolitan Museum of New York. They were later bought by the Frederick Hepburn Company, and was acquired by Ralph Coxhead in the early 1930's.

The first offices of the Ralph C. Coxhead Corporation were at 17 Park Place in New York City. He saw applications for the Varityper to be used for composing type for office duplicators. With its myriad selection of type faces (then called plates) and the ability to have two typefaces in the machine at the same time, a secretary could mix roman and bold or italic in the same document. You must remember that stencil duplicating was the best way to make copies, and creating these master for "mimeographing"[1] was a huge application for the Varityper.

[1] Mimeograph is the trade name for the duplicating equipment manufactured and sold by A. B. Dick, although it became the common name for all this type of duplicating.

As early as 1939, a Varityper type face catalog showed as many as 67 typefaces. These faces which were all mono spaced fonts which covered the gamut from the common pica and elite to chemical symbols, mathematical, fractional, astrological, international phonetics, tariff symbols, italic, back slant italic, as well as a script face.

So with this many variations in type face design, the Varityper could serve a wide and diverse market, all from the business office. It was also interesting to note that back in 1939 Coxhead coined a word for this, which was "Varitypography."

Now you must remember, that this machine at that time had the capacity to justify copy, and since you had two fonts of 90 characters available, your character selection was very wide. Some of the text faces available at that time also had the common ligatures fi, ff an fl.

The advantages the Varityper had over the regular office typewriter were quite unique. The four major advantages were:

Changeable type—Permits the selection of the most attractive and appropriate type for the application.

Changeable spacing—Allows horizontal spacing consistent with the size and style of type selected.

Uniform impression—Is mechanically controlled, no light and heavy letters (typewriters had each key on its own bale).

Good alignment—The fonts 90 characters, letters and figures are a unit ensuring perfect alignment.

As I mentioned before stencil duplicating was at it's height, and the Varityper with its unique features was able to capture market share as the perfect machine for this application. Since large reports or lengthy state-

ments could be reduced, saving the number of stencils required, the amount of pages could be reduced saving paper, run time, and even postage costs. The 180 characters gave the operator control over the need for special symbols and figures as well as fractions.

To quote from a catalog of that time:

"While it is true that the Photo-offset printing has long since passed the experimental stage, the element that inconvenienced the producers and users was the preparation of copy. It was necessary to set type, run a proof and photograph the proof, or typewrite the copy for photographing. Typesetting is slow and expensive and increases the cost, while typewriting gives the finished printing a very ordinary appearance.

The Varityper, with its interchangeable types and spacings, combined with its mechanically controlled impression, has developed into a practical composing machine for this rapidly developing industry."

Thus a burgeoning market was created!

One of the most fascinating products of this machine was the type font, or plate as it was called then. Since the design of typefaces has always been my end of the business, I think it important to explain the design and manufacturing aspects of these typefonts.

Design

All letters for each new font had to be hand drawn, and produced on a ratio of 50/1 on a paper pattern. These paper patterns were then put on a Pantograph machine, and a set of brass plates were made 10 times over actual size. With each character on a brass plate, the integrity of the design, and in later years for differential spacing, the actual placement of the character in the assigned unit value. After the set of brass plates was checked and approved, an actual test font would be made using the brass plates and the Pantograph to ratio the font to actual size. This test image

was cut into plastic, which gave the appearance of how the final font would look with the ink spread form the ribbon. This process probably consumed a period of 3 months from the start of design to the first test font in plastic.

But, we have just only begun! Once the font was all checked and all 90 characters approved, it was necessary to cut a set of 2 female masters to be used as plating master to mold the two segments which comprised the full font.

The operations in creating a font are as follows:

1. Back blank is Duralumin, which is blanked with 8 rectangular slots pierced into to hold the web. Maximum tolerance is ±.001"

2. Web is made of nickel silver. Material thickness is held to ±.0005" It is die cut with a ±.001" radial tolerance, and a ±.0005" tolerance on the projections.

3. The type back is produced by uniting pieces 1 and 2 together in a rolling press which produces knurled surfaces for shell (actual type segments) bonding. Radial tolerance held to ±.00051.

4. Type face shell is nickel produced by electro-forming process. Thickness is held ±.0005" tolerance. This metal is as tough as tool steel. A flashing plating of chromium gives additional hardness.

5. Type face shells and type back are bonded together in a hydraulic press to form the completed TYPE FONT. The press is heated to 340°F with hydraulic pressure of 35,000 lbs. Radial tolerance in this critical step must be held to ±.0005".

6. Back of type font is machined to proper thickness with ±.0005" tolerance. Web is shaped with wider area at center.

7. Using index line (next to Capital B) on font, the three holes are pierced for the bushing. Tolerance ±.00005".

8. Steel bushing requiring eight operations on four different machines, tolerances within ±.0005", is inserted and secured with two brass rivets.

The completed type font weighs less than one-fifth of an ounce, and is made of chromium, nickel duralumin, nickel-silver, steel, brass, backing and bonding materials, and lots of technical know-how.

For a financial look at what all this technology cost, I refer back to a book of about 1940 vintage. The Varityper itself came in 3 different carriage lengths and cost as follows:

9" carriage	(8.1" writing line)	$ 175.00	$ 210.00
16" carriage	(15" writing line)	210.00	260.00
20" carriage	(20" writing line)	240.00	295.00
24" carriage	(24" writing line)	270.00	330.00

In addition it came in four different spacings (between characters), which were as follows:

Designation	
Q	10-12-14 characters to the inch
T	10-12-16 characters to the inch
L	10-14-16 characters to the inch
W	12-14-16 characters to the inch

The type fonts were an incredible price of $8.50 each.

It also must be remembered that all these type fonts were unit spaced fonts. So even thought they had different pitches (characters per inch) each character was the same width, thus the lower case "i" took up the same space as the cap "M."

So we had a desk top machine, that could be operated by a trained secretary or typist that could perform all sorts of things. We have changeable type, 2 fonts of 90 characters, automatic justification (with a second typing), variable horizontal and vertical spacings, and even a bold face heading feature that allowed the operator to repeat a few words or sentences by holding down a repeat key.

The Varityper was a complicated machine, and to design types for it had it own set of rules. Since each of the 90 characters was on a plate or font, the mechanism had to bring the plate to the paper, and exert enough pressure to cause an image to be transferred through a carbon ribbon onto the paper. This was controlled by a hammer mechanism, which met the character at the point of impact. The ribbon was fed through a "ribbon shield," which allowed only one character at a time to be impressed into the paper. The hammer mechanism had a maximum width, which meant that no character could be wider than the hammer.

This then established the maximum width of cap "M's" and "W's" so that this became the determiner of the relative size of the rest of the alphabet. With the unit spacing fonts, it was rather easy, as each character was the same width, but when development started on the differential machines, this became an important part of the development.

Again, we only had three increment values available: two units, three units and four units. The two units would be allocated for the lower case i, j, l, t, and cap I and perhaps the f, and punctuation and points. The three units the bulk of the characters, and the four units left for m's and

w's. In most cases the cap "M" and "W" had to be condensed to fit within the scope of the hammer.

This was also a limiting factor in designing italics. It was necessary to offset the character to allow for the slant, but we could not produce 12 point sizes because of the limitation of the hammer head.

This really was not different than the problem facing designers who designed types for the Linotype machine. Because of the limitations on the "brass width" of characters that ran in magazines, most normal types had to have the cap "M" and "W's" condensed slightly starting at 12 point size. Although this may have been a slightly condensation, it did effect the overall design in comparison to a foundry version of the same type style.

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